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FUNGI AND FUNGOUS DISEASES

LECTURE I *

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NEW ORLEANS

FUNGI

Historical—Morphologic Characters of Fungi—Classification—Biochemical Activities of Fungi—Symbiosis—A Mycologic Method for the Identification of Various Sugars and Other Carbohydrates.

Mycology, the science that deals with the study and investigation of fungi *sensu stricto* or mycetes, in contrast to bacteriology, has attracted comparatively little notice in recent years. Scant attention has been paid to the enormously important rôle played in nature by fungi and to the evil they are capable of doing, as well as to the beneficent functions they may perform.

It is interesting to note, however, that mycology came into existence long before bacteriology. It may be said to have begun in the days of Charles II, when Hooke, in 1677, constructed a magnifying lens with which he examined the yellow spots so often present on the leaves of the damask rose, and found that they consisted of filamentous fungi of which he gave a detailed description and left remarkably good drawings. He believed that fungi arose from decaying matter by a process of spontaneous generation. Malpighi, in 1686, devoted a chapter to "Plantis quae in aliis vegetant," in which he refers to fungi of the genus *Mucedo*. Ray, in 1706, in his "Historia Plantarum" described *Pilobolus crystallinus*, one of the mucoraceae which has beautiful crystalline sporangia. Micheli, in 1729, gave an account of the genus *Aspergillus* and many other fungi. In 1752, Linnaeus, in his famous book "Species Plantarum," collected all that was known at the time on the subject, and named a large number of species. After Linnaeus,

* The Adolph Gehrmann Lectures of the University of Illinois College of Medicine, 1926.

many botanists carried out investigations on fungi: it suffices to mention the names of Hudson, who described many mucors in his "Flora Anglica" (1762); Lightfoot, who published an important work on the Scottish flora in 1777; Pelham (1785); Withering (1795); Batsh (1783) in Germany, and Bulliard (1791) in France.

At the beginning of the last century, the progress became rapid, and the only way to trace its evolution is to mention the great systematic works, which are used for reference. The principal ones are Persoon (1801) "Synopsis Methodica Fungorum"; Link (1824) "Caroli Linné Species Plantarum" (1824). Editio Quarto tomus VI, p. 1; Fries (1821-1829) "Systema Mycologicum"; Nees von Esenbeck and Henry (1837) "Das System der Pilze"; Kutzing (1849) "Species Algarum"; Charles Robin (1853) "Vegetaux Parasites"; Kucheinmeister (1857) "Animal and Vegetal Parasites of Man; Fuckel (1869-1870) "Symbolae Mycologiae"; Eidam (1872) "Mycologie"; Naegeli (1877) "Die Niederen Pilze."

In 1881, Winter, Rehm, Fischer and Lindau's "Die Pilze Deutschlands" began to appear, and in 1886, Saccardo's great work of reference, the "Sylloge Fungorum," began. Both have continued to the present period. In 1890, Zopf published his well known work, "Die Pilze"; in 1900, Engler and Prantl published the "Pflanzen familien"; in 1907, Vuillemin started his new classification in his paper, "Les bases actuelles de la systematique en mycologie." Pollacci and Nannizzi in 1924 started the publication of an exhaustive work on pathogenic fungi "Imiceti patogeni dell'Uomo e degli Animalin."

Parasitic fungi of man[1] did not attract attention until the beginning of the last century. The first important fungus discovered was the thrush-fungus, observed by Langenbeck in 1839. He discovered it at autopsy in a case of typhus while examining microscopically the white patches of thrush in the oral mucosa, the pharynx and the whole of the intestinal tract. He believed at first that the fungus was the cause not only of the white patches but also of the typhus infection from which the patient died. The knowledge of this fungus was greatly increased in 1843 by the investigations of Charles Robin, who called it *Oidium albicans*. Robin also wrote a book on mycology which has remained classic: "Histoire naturelle des vegetaux parasites qui croissent sur l'homme et sur les animaux vivants."[2] The idea that thrush was a mycologic condition was not generally accepted for a long

1. Medical mycology is quite extensively dealt with in Brumpt's "Précis de Parasitologie" and Castellani and Chalmer's "Manual of Tropical Medicine."

2. Robin: Histoire naturelle des vegetaux parasites qui croissent sur l'homme et sur les animaux vivants, Paris, J. B. Baillière, 1853.

time. Even a number of years after Robin's classic work, many physicians did not believe in it. In one of the most popular textbooks on pathology of the fifties and the sixties of last century, one reads that the thrush patches are the result of morbid secretion of the oral mucosa, and the author added: "A mycologist, however, has brought forward the very peculiar hypothesis that these patches are caused by a fungus." In the same year that the fungus of thrush was discovered by Lagenbeck, another important fungus was found: the fungus of favus, by Schönlein. This organism a little later was further investigated by Lebert, who called it *Oidium schönleinii,* and subsequently by Remack, who named it *Achorion schönleinii.* In 1844, the fungus of ringworm was found by Gruby, who also pointed out the important difference between ringworm fungi of the large spore type and of the small spore type, an idea which was ridiculed at the time, and completely forgotten later, until Sabouraud, many years after, made the same distinction and called attention to Gruby's forgotten work.

In 1846, Eichstedt discovered the fungus of pityriasis versicolor.

Mycology continued to attract attention until the seventies and eighties of last century, when the great discoveries by Pasteur and Koch in the field of bacteria brought bacteriology to the foreground, and mycology was placed in the background, where it has remained until the present. There can be little doubt, however, that in future years the great importance of mycology will be recognized; one has only to remember that more than 20 per cent of tropical diseases *sensu stricto* are caused by fungi, and that diseases due to fungi are also not at all rare in temperate climates.

GENERAL REMARKS

Morphologic Characters of Fungi. Classification.—As is well known, the *regnum vegetabile* is usually divided into four large groups or phyta:

1. *Spermatophyta,* or seed plants.
2. *Pteridophyta,* or fern plants.
3. *Bryophyta,* or moss plants.
4. *Thallophyta,* or thallus plants.

Thallophyta, to which the fungi belong, are generally filamentous plants, of simple cellular structure, which differ from other plants in that they do not develop a complex plant—body with differentiation into roots, stem and leaves.

Thallophyta are separated into two large subdivisions:

1. *Algae,* chlorophyl present.
2. *Fungaceae* (fungi *sensu lato*), chlorophyl absent.

Fungaceae or fungi *sensu lato* may be divided into two large groups:

(*a*) Bacteria, or lower fungi *(Schizomycetaceae)*, unicellular plants, of minute dimensions, which multiply usually by cell fission.

(*b*) Fungi *sensu stricto*, higher fungi, mycetes *(Mycetaceae)*, unicellular or pleuricellular plants, of larger dimensions than bacteria, which multiply by processes other than simple cell fission, usually by means of asexual or sexual spores.

At present the term "mycology" is limited to the study of the higher fungi or mycetes, while "bacteriology" deals with the lower fungi or bacteria.

Fungi, not possessing chlorophyl, are unable to build up their food from the carbon dioxide of the air, and must obtain it from larger vegetal organisms, from animals or from decaying matter. Fungi may be parasitic or saprophytic: parasitic fungi grow and obtain their food from living animals or living plants; saprophytic fungi grow and feed on dead plants or decaying matter in general. In medical literature, the term "saprophytic" is used to denote a fungus that is not pathogenic.

Some fungi are always saprophytic, others always parasitic; but there are also fungi which are facultative parasites—that is, they are saprophytic, but under certain conditions they become parasitic. The animal or plant on which the fungus grows is said to be the "host."

As in the case with the flowering plants, a fungus consists of (1) a vegetative part (thallus, mycelium) devoted to the acquisition of food; (2) a reproductive part. The vegetative part consists of fine filaments or threads called "hyphae"; a collection of hyphae is known as mycelium "vegetative part of the fungus." A hypha is a hollow cylindric tube containing protoplasm and divided at intervals by partitions called "septa." It may be of different shapes, straight, curved or banana-like. Hyphae may have peculiar morphologic characteristics of great importance for classification: for instance, the peculiar swellings on the hyphae of the *Borellineae* and the clamp connections of the *Basidiomycetae*.

Reproduction.—Fungi reproduce by means of specialized cells termed spores, which may in a way be said to represent the seeds of the flowering plants. A fungus spore is merely a spheric, oval or elongated cell with a thin wall, and containing protoplasm. A spore may multiply by budding, producing daughter spores identical with the parent spore; if a spore meets with favorable conditions, it may germinate by growing out a filament or hypha, which develops into a mycelium.

The spores belong to two types: those that are sexual in origin, and those that are asexual in origin. The asexual spores are those which are not the result of the fusion of two sex cells or gametes. Practically all fungi produce asexual spores; some produce both asexual and sexual spores.

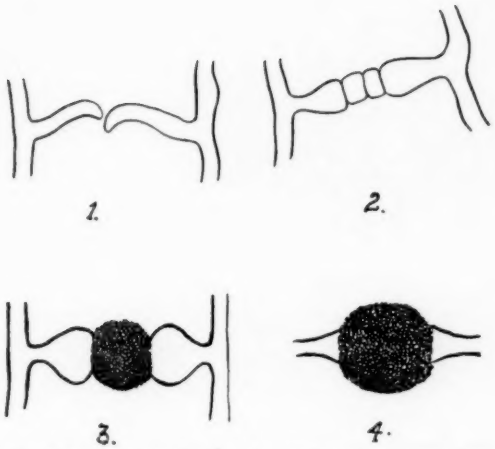


Fig. 1.—Various stages in the process of zygosporosis.

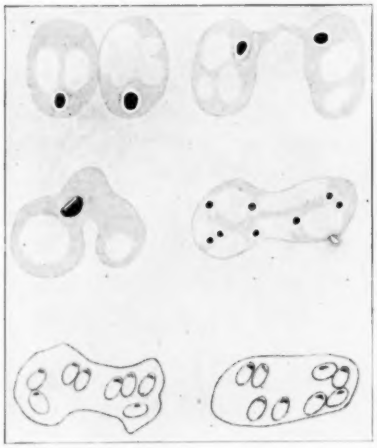


Fig. 2.—Zygosis and formation of an ascus with ascospores in Zygosaccharomyces octosporus (after Guilliermond).

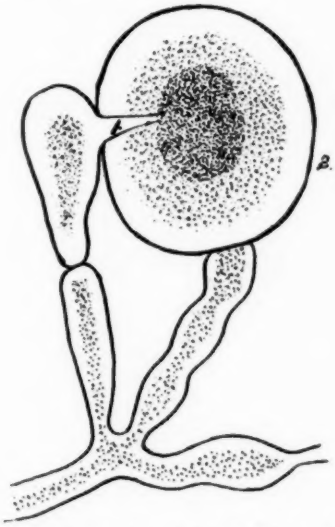


Fig. 3.—Sexual conjugation: (1) Antheridium; (2) Oösporangium.

Fungi are classified principally according to the manner in which the spores are produced, their shape and their color. There are several kinds of spores. The principal ones are the following:

1. *Gonidia* (endospores *sensu stricto,* ascospores *pro parte*).—These spores are not born free; they are formed usually by a highly complicated process, or born in a case or receptacle, or saclike cell, which is often terminal. When there are 2, 4, 8 or a multiple of 8 spores, they are generally called ascospores, and the receptacle is an ascus.

2. *Zygospores.*—These spores result from a conjugation of two cells (gametes) that are morphologically identical in shape, and do not show any sexual differentiation. The two gametes come into contact and unite, forming a large cell with a resistant double wall called "zygospore."

3. *Oöspores.*—These result from the conjugation of two sexually differentiated elements or gametes: the male element, antheridium, and the female element, oösporangium or oögonium. The oösporangium generally has a thick capsule with pores, and contains several roundish protoplasmic masses: female gametes, macrogametes or oöspheres.

The male element (male gamete, antheridium) which originates on a special delicate hypha comes into contact with the oösporangium, sending a protoplasmatic process through it. The antheridium may divide into several motile bodies (antherozoids, spermatozoids) which fertilize the female gametes.

4. *Conidia* (or exospores).—These spores are born free, not in a saclike cell or case, or receptacle; the branch bearing them is called a conidiophore. Conidia originate asexually from the mycelial threads by a process of budding, septation or abstriction. Conidia may be pedunculated or nonpedunculated, lateral or terminal.

According to their size, conidia may be divided into macroconidia and microconidia. Among the macroconidia may be mentioned the so-called "fuseaux" or spindles of French authors, which are large conidia of a particularly differentiated type, being large, spindle-shaped, thick walled and sometimes septate transversely. The shape of these macroconidia is characteristic in the genus *Trichophyton* and the genus *Microsporum.*

Many authorities make a distinction between true conidia and pseudoconidia or aleuriospores. True conidia are easily detached from the mycelial hyphae which bear them, and when they have become free they originate new spores by a process of budding, or give rise to mycelial filaments by germination. True conidia are incapable of forming new spores or new mycelial threads while they remain attached to the parent mycelium. The mycelial hypha which carries the conidia is termed conidiophore or sporophore; a phialide is a flask-shaped segment

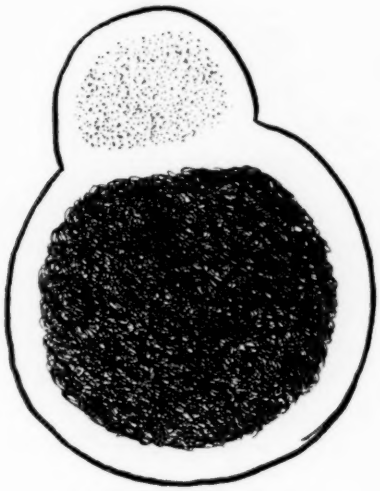


Fig. 4.—Blastospore.

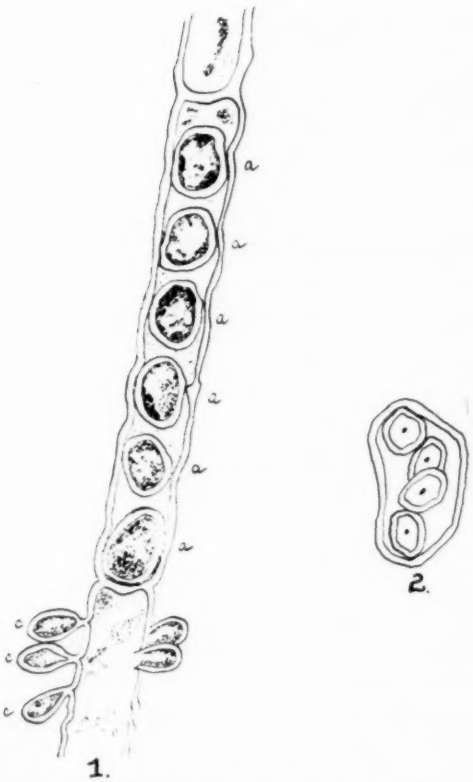


Fig. 5.—Endomyces vuillemini Landrieu, from a culture (after Vuillemin): (1) mycelial thread with arthrospores (*a*) and conidia (*c*); (2) ascus fructifications.

interposed between the sporophore and the conidia; a prophialide is a special article on the sporophore which supports several phialides.

The false conidia, or pseudoconidia, or aleuriospores, which may be lateral, terminal or intercalary, are not originally distinct from the thallus and are not easily detached; they are only set free by the death of the mycelial hypha to which they are attached.

5. *Thallospores.*—A thallospore is merely a portion of the thallus, or vegetative body, that becomes secondarily adapted to the purposes of reproduction. There are several varieties of thallospores, the principal ones being:

The blastospore, which is oval or roundish, is formed by a process of budding.

The arthrospore, or mycelial spore, is formed simply by the segmentation and disarticulation of a hyphal element or mycelial thread: it is at first square, and later becomes roundish or oval.

The chlamydospore is merely an arthrospore of large size that is undergoing encystment.

6. *Hemispores.*—The hemispore starts by a differentiation from the thallus, the "protoconidium," but this remains where it is formed, while the hypha continues to grow; later the protoconidium forms secondary functional spores which are called "deuteroconidia"; these are the true reproductive spores.

Classification of Fungi

Fungi may be separated into two large divisions:

A. Vegetative body under form of a multinucleate, naked plasmodium—*Myxomycetes.*

B. Vegetative body usually filamentous—*Eumycetes.*

Fungi parasitic of man belong to *Eumycetes,* which may be subdivided as follows:

Class I: Reproduction by freeborn spores (conidia) that are never contained in a case or receptacle; septate mycelium—*Fungi imperfecti* or *Hyphomycetes.*

Class II: Reproduction by ascospores; mycelium septate when present—*Ascomycetes.*

Class III: Mycelium nonseptate in vegetative stage; reproduction by zygospores—*Phycomycetes.*

Class IV: Reproduction by basidiospores; septate mycelium—*Basidiomycetes.* A basidium is a clublike hypha from the claviform portion of which two or four short delicate filaments originate, each of which bears a single spore (basidiospore).

TABLE 1.—*Classification of Fungi*

FUNGI	Class I: Fungi imperfecti Subclass Hyphales (Hyphomycetes) Mycelium septate, asci absent	Order 1: Microsiphonales Mycelial hyphae bacilliform	Family Mycobacteriaceae Definite mycelium absent	Genus Mycobacterium Lehmann and Neumann Genus Leptothrix Kützing Genus Cladothrix Cohn Genus Vibriothrix Castellani
			Family Nocardiaceae Castellani and Chalmers Definite mycelium present	Genus Nocardia Toni and Trevisan Genus Cohnistreptothrix Pinoy
		Order II: Thallosporales Mycelial hyphae more than 1 micron in diameter; reproduction by thallospores — Suborder Blastosporineae.. Reproduction by blastospores	Family Cryptococcoceae Kützing Hyphae and spores alike being yeastlike	Genus Cryptococcus Kützing Genus Pityrosporum Sabouraud Genus Torula Persoon Genus Mycoderma Persoon
			Family Oosporaceae Saccardo Mycelial hyphae present, spores typically in chains	Genus Oöspora Wallroth Genus Monilia Persoon Genus Oidium Link
			Family Enantiothamnaceae Castellani and Chalmers Conidia arranged vertically round mycelial septa	Genus Enantiothamnus Pinoy
			Family Haplographiaceae Saccardo Conidia in grapelike masses	Genus Hormodendrum Bonorden Genus Malassezia Baillon
			Family Cladosporiaceae Saccardo Conidia solitary or in chains	Genus Cladosporium Link
		— Suborder Arthrosporineae Reproduction by arthrospores	(three genera parasitic in man)	Genus Trichosporum Behrend Genus Madurella Brumpt Genus Indiella Brumpt
		Order III: Hemisporales Mycelial hyphae more than 1 micron; reproduction by hemispores	Family Hemisporaceae Castellani and Chalmers Characters of order	Genus Hemispora Vuillemin
		Order IV: Conidiosporales Mycelial hyphae not bacilliform; reproduction by conidia — Suborder Aleuriosporineae Reproduction by aleuriospores	Family Aleurismaceae Vuillemin Conidiophores absent	Genus Acladium Link Genus Glenospora Berkeley and Curtis Genus Trichothecium Link
			Family Monotosporaceae Vuillemin Conidiophores present	
		— Suborder Sporotrichineae.. Reproduction by true conidia; true conidiophores absent		Genus Sporotrichum Link
		— Suborder Sporophoralineae Reproduction by true conidia borne on true conidiophores		Genus Acremonium Link Genus Scedosporium Saccardo
		— Suborder Phialidineae..... Conidia borne on phialides		Genus Scopulariopsis Bainier
	Class II: Ascomycetes Asci present, mycelium septate when present	Order Saccharomycetales..... Asci not gathered into definite perithecia	Family Saccharomycetaceae Rees No definite mycelium	Genus Nematospora Peglion Genus Monospora Metchnikoff Genus Schizosaccharomyces Beyerinck Genus Hansenia Linder Genus Torulospora Linder Genus Pichia Hansen Genus Willia Hansen Genus Saccharomycodes Hansen Genus Zygosaccharomyces Barker Genus Saccharomycopsis Schönning Genus Schionniomyces Klöcher Genus Debaryomyces Klöcher Genus Saccharomyces Meyen
			Family Endomycetaceae Rees Vegetative cells form mycelium	Genus Endomyces Rees Genus Coccidioides Rixford and Gilchrist
		Order Aspergillales Asci usually gathered into cylindric or globose perithecia — Family Gymnoascaceae Baranetzky Peridium of loose hyphae; reproduction by mycelial or conidial spores	Tribe Gymnoasceae Castellani and Chalmers Perithecia and asci present	Genus Trichophyton Malmsten Genus Microsporum Gruby
			Tribe Trichophytoneae Castellani and Chalmers.... Definite perithecia and asci absent; asexual reproduction by conidia and arthrospores	Genus Neotrichophyton Castellani & Chalmers Genus Ectotrichophyton Castellani & Chalmers Genus Atrichophyton Castellani and Chalmers Genus Achorion Remak Genus Endodermophyton Castellani Genus Epidermophyton Lang
		— Family Aspergillaceae Baranetzky Small sessile closed perithecia; compact peridium		Genus Penicillium Link Genus Aspergillus Micheli Genus Sterigmatocystis Cramer
	Class III: Phycomycetes Mycelium continuous nonseptate in vegetative stage	Order Entomophthorales..... Solitary asexual spores in sporangium		
		Order Mucorales (only one family parasitic in man) Several asexual spores in sporangium	Family Mucoraceae Asexual spores in typical sporangia; columella present	Genus Mucor Micheli Genus Lichtheimia Vuillemin Genus Rhizomucor Lucet and Costantin Genus Rhizopus Ehrenberg

UNIV. OF MICH.

CLASS I. FUNGI IMPERFECTI FUCKEL, 1869

The class *Fungi imperfecti* Fuckel, 1869, is most important from a medical point of view; it may be subdivided into (*a*) *Deuteromycetes* Saccardo, 1886 (accessory fructifications present), and (*b*) *Hyphales* Vuillemin, 1910 (accessory fructifications absent). Only the latter group contains fungi parasitic of man. It may be classified as follows:

	Order I.	*Microsiphonales* Vuillemin, 1912. (Hyphae bacilliform, 1 micron or less in diameter.)
	Order II.	*Thallosporales* Vuillemin, 1910. (Reproduction by thallospores.)
Hyphales Vuillemin		
Hyphomycetes Fries	Order III.	*Hemisporales* Vuillemin, 1910. (Reproduction by hemispores.)
	Order IV.	*Conidiosporales* Vuillemin, 1910. (Reproduction by conidia).

ORDER I. MICROSIPHONALES VUILLEMIN, 1912

Definition.—*Hyphales* with the mycelium composed of fine bacillus-like hyphae, usually 1 micron or less in diameter; generally gram-positive when young, and without distinct nuclei. Parasitic on man, animals and plants, or saprophytic.

Remarks.—This is a most interesting order, as the organisms belonging to it are nearly always mistaken at first sight for bacilli: hence the description of bacilli as the cause of so many fungal diseases due to these organisms.

The order may be divided into families as follows:

A. *Nocardiaceae* Castellani and Chalmers, 1918.

Synonyms.—*Actinomycetes* Lachner-Sandoval, 1898; *Trichomycetes* Petrusky, 1903.

Definition.—*Microsiphonales* with a mycelium.

Type Genus.—*Nocardia* Toni and Trevisan, 1889.

B. *Mycobacteriaceae* Miehe, 1909.

Definition.—*Microsiphonales* without a mycelium.

Genus 1.—*Mycobacterium* Lehmann and Neumann, with the tubercle bacillus as a type.

Genus 2.—*Corynebacterium* Lehmann and Neumann, with the diphtheria bacillus as a type.

Most authorities place *Mycobacteriaceae* in *Schizomycetes* (bacteria).

Family *Nocardiaceae* Castellani and Chalmers, 1918.

Synonyms.—*Actinomycetes* Lachner-Sandoval, 1898; *Trichomycetes* Petrusky, 1903.

Definition.—*Microsiphonales* with a mycelium.

Type Genus.—*Nocardia* Toni and Trevisan, 1889.

Classification.—Until recently all the species of this order were considered to belong to one genus, i. e., *Nocardia* Toni and Trevisan, 1889, but Pinoy has made a subdivision, separating certain species into another genus, which he calls *Cohnistreptothrix* Pinoy, 1911. In doing this, he points out that the original discoverers of actinomycosis, namely, Harz and Bollinger in 1877, and Rivolta in 1878, thought that they were dealing with one organism, but when they attempted to make cultures, it became apparent that more than one organism was implicated. Thus, Bostrom isolated a parasite which grew well aerobically, produced a dry membrane on the surface of broth and was capable of growth at 20 C. on gelatin, but which grew better on potato at 37 C., and formed chains of arthrospores.

Wolf and Israel, on the other hand, obtained a parasite which grew only anaerobically and was not capable of growth at ordinary European air temperature. In broth it formed small granules or scales which fell to the bottom of the tube. These cultures often contained clublike forms, and the branching filaments broke up into bacillar or coccal-like

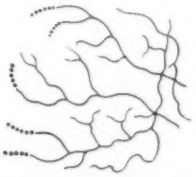


Fig. 6.—Nocardia buccalis (after Roger and Sartory).

forms. Inoculation of gelatin cultures into the peritoneal cavity of guinea-pigs produced actinomycosis. This form is commonly called *Nocardia israeli* (Kruse, 1896). Wright maintains that this organism is the true cause of actinomycosis and that *N. bovis* is merely a contamination, but this is not generally accepted.

There are, however, two distinct organisms which can cause actinomycosis in man and oxen, viz., *N. bovis* (Harz, 1877) and *N. israeli* (Kruse, 1896), but the difference between them is considerable, and therefore Pinoy has separated the latter and its allies from the former and has founded the new genus *Cohnistreptothrix* Pinoy, 1911. These two genera are distinguished as follows:

A. Grows aerobically, easy of cultivation, and produces arthrospores—genus 1, *Nocardia* Toni and Trevisan, 1889.

B. Grows best anaerobically, but can often grow aerobically, difficult of culture, and does not produce arthrospores—genus 2, *Cohnistreptothrix* Pinoy, 1911.

Classification of Genus Nocardia.—The numerous species of this genus may be separated into three sections:

I. Habitat, soil; can be found in air or water—section I, *Saprophytica* Foulerton, 1910.

TABLE 2.—*Diagnostic Classification of the Species of the Section Saprophytica, Subsection Majora*

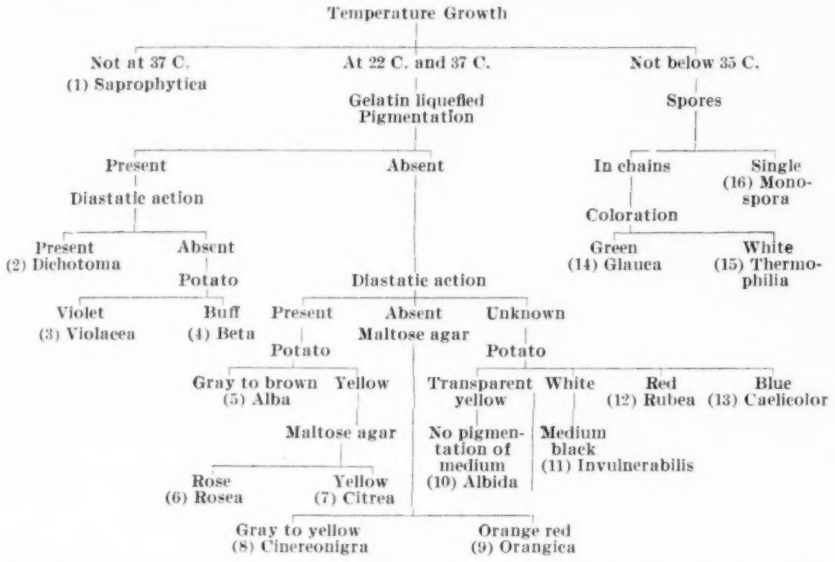
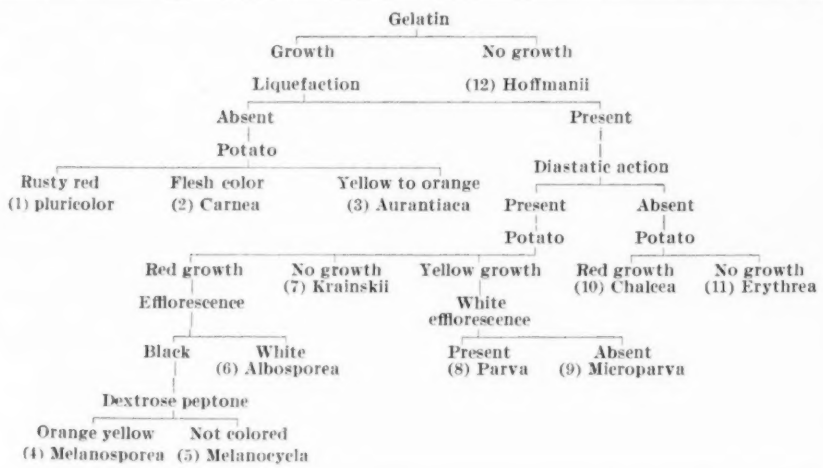


TABLE 3.—*Diagnostic Classification of the Species of Section Saprophytica, Subsection Minora*



II. Habitat, plants or animals—section II, *Parasitica* Foulerton, 1910.

III. Habitat, soil, plants or animals, but imperfectly described—section III, Incertae Sedis.

Section I, *Saprophytica* may be divided into two subsections:

(*a*) Majora, abundant growth at 22 C., well marked earthy or moldy smell, usually peptonize gelatin.

(*b*) Minora, growth less abundant, earthy or moldy smell absent or faint, gelatin rarely peptonized.

TABLE 4.—*Diagnostic Classification of the Species of the Section Parasitica, Subsection Majora*

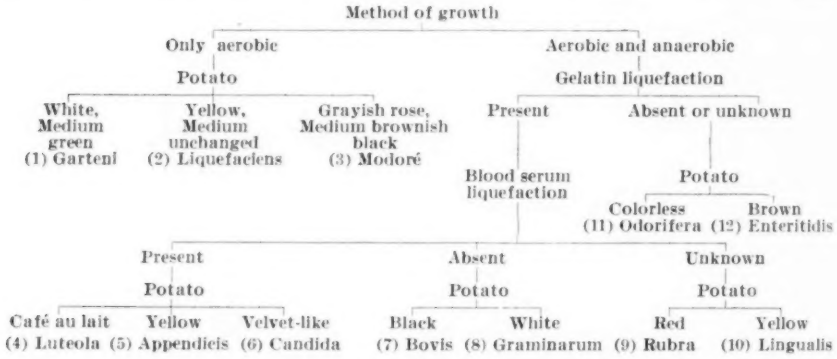
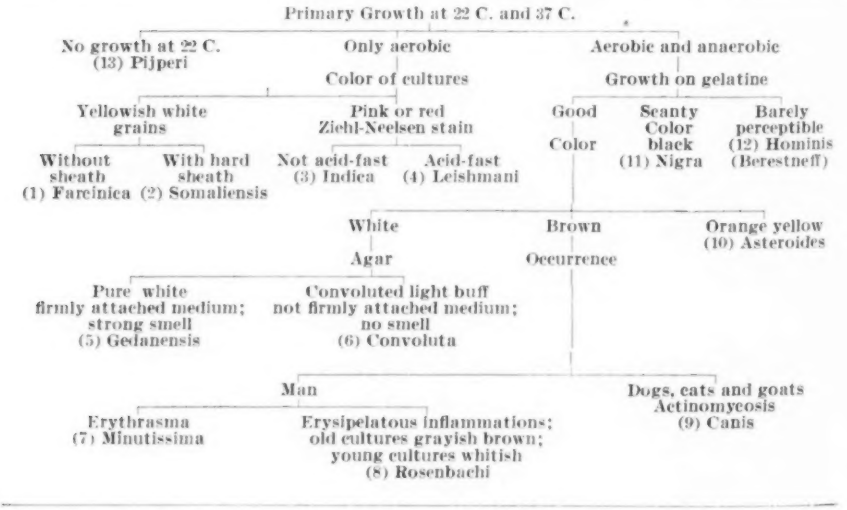


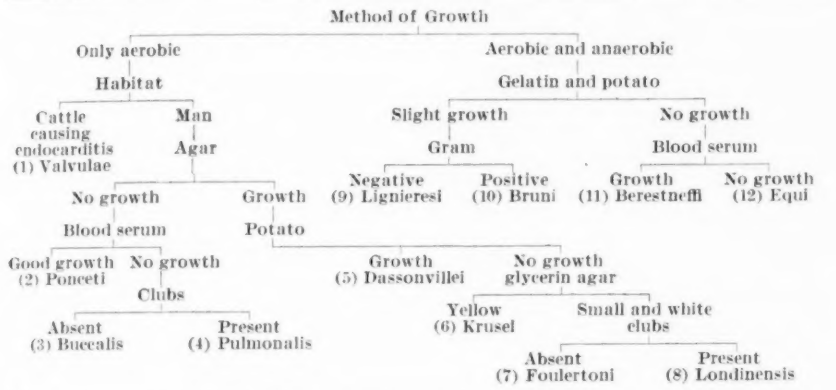
TABLE 5.—*Diagnostic Classification of the Species of Section Parasitica, Subsection Minora*


Primary Growth at 22 C. and 37 C.
No growth at 22 C. (13) Pijperi
Only aerobic
Aerobic and anaerobic
Color of cultures
Growth on gelatine
Yellowish white grains
Pink or red Ziehl-Neelsen stain
Good Color
Scanty Color black (11) Nigra
Barely perceptible (12) Hominis (Berestneff)
Without sheath (1) Farcinica
With hard sheath (2) Somaliensis
Not acid-fast (3) Indica
Acid-fast (4) Leishmani
White
Brown
Orange yellow (10) Asteroides
Agar
Occurrence
Pure white firmly attached medium; strong smell (5) Gedanensis
Convoluted light buff not firmly attached medium; no smell (6) Convoluta
Man
Dogs, cats and goats Actinomycosis (9) Canis
Erythrasma (7) Minutissima
Erysipelatous inflammations; old cultures grayish brown; young cultures whitish (8) Rosenbachi

Section II, *Parasitica* may be separated into three subsections:

(*a*) Majora, growth at 22 C. spreading, efflorescence, bright, chalky.
(*b*) Minora, growth at 22 C. circumscribed, efflorescence, dull, powdery.
(*c*) Brevis, growth at 22 C. slight, efflorescence usually absent.

TABLE 6.—*Diagnostic Classification of the Species of the Section Parasitica, Subsection Brevis*



Genus *Cohnistreptothrix* Pinoy, 1911.

Definition.—*Nocardiaceae* growing best, or solely, anaerobically; usually difficult to cultivate; arthrospores absent.

Type species.—*Cohnistreptothrix israeli* (Kruse, 1896).

Classification.—The following are the principal species: *C. israeli* Kruse, 1896; *C. thibiergei* Pinoy and Ravaut, 1909; *C. foersteri* Cohn, 1874; *C. tenuis* Castellani, 1911.

1. *Cohnistreptothrix israeli* Kruse, 1896. Found in cases of human and bovine actinomycosis; differs from *Nocardia bovis* in being strictly anaerobic; pathogenic to laboratory animals producing fairly large yellow granules.

2. *Cohnistreptothrix thibiergei* Pinoy and Ravaut, 1909. Isolated by Pinoy and Ravaut from a peculiar nodular condition; may be cultivated aerobically and anaerobically; grains smaller than those produced by *C. israeli.*

3. *Cohnistreptothrix foersteri* Cohn, 1874. Found in concretions in the lachrymal canals; can be grown with great difficulty aerobically and anaerobically; colonies on maltose agar cerebriform, grayish.

4. *Cohnistreptothrix tenuis* Castellani, 1911. Produces a nodular condition of the hair of the axillary regions; in the nodules the organism appears in the shape of bacillary-like bodies, gram-positive, not acid-fast, packed together and embedded in an amorphous cementing substance; has not been cultivated.

A more complete description of the various species of *Nocardia* and *Cohnistreptothrix* may be found in Castellani and Chalmers' "Manual of Tropical Medicine," edition 3.[3]

A few words may be added on certain filamentous vegetal organisms, on the classification of which there is much discussion and which are hardly mentioned in textbooks, viz., organisms of the genus *Leptothrix*, of the genus *Cladothrix* and of the genus *Vibriothrix*.

Genus *Leptothrix* Kützing, 1843.

Definition.—Filamentous fungi with long, thin mycelial threads, and no capsule or only a delicate one; nonbranching, nonseptate, generally noncultivatable.

Type Species.—Leptothrix maxima, Miller.

The following species have been described:

Leptothrix maxima Miller, 1882. *Synonym.—L. buccalis maxima* Miller. Long thin filaments, unsegmented, or with long segments; when treated with iodine and dilute sulphuric acid gives a blue granulous reaction; has not been cultivated.

Leptothrix innominata Miller, 1882. Morphologically identical with *L. maxima,* but when treated with iodine and dilute sulphuric acid does not give a blue reaction; has not been cultivated.

Leptothrix racemosa Miller, 1882. Filaments somewhat thicker than those found in the two preceding species; on staining shows a peculiar beaded appearance; has not been cultivated.

Leptothrix placoides Dobrzyniecki. Long thin filaments, gram-positive, nonmotile; gelatin liquefied; growth on agar slow; produces hard granular colonies; isolated from human mouth by Dobrzyniecki.

Leptothrix filiformis Flexner, 1896. *Synonym.—Bacillus (Leptothrix?) pyogenes filiformis* Flexner, 1896. Isolated by Flexner from a rabbit; is nonmotile, of difficult cultivation, pathogenic.

Leptothrix vaginalis Donne, 1885. Found in vagina of women and animals.

Genus *Cladothrix* Cohn, 1875.

Definition.—Filamentous fungi with mycelial threads, long, thin, showing pseudobranching. The only well known species is *Cladothrix dichotoma* Cohn.

Cladothrix dichotoma Cohn, 1817. Long, thick mycelial threads straight or slightly undulating. They are not dichtomous, as the name would suggest; it is merely a case of pseudobranching. The organism can be cultivated on ordinary laboratory mediums, forming on agar a brownish, wrinkled, tough, membranous layer, very adherent. The

3. Castellani, Aldo, and Chalmers, A. J.: Manual of Tropical Medicine, ed. 3, New York, William Wood & Co., 1920.

medium may become stained, slightly brownish. The organism is found often in waters. I have found it, or a similar species, in an ulcer of the foot in association with many other organisms.

Genus *Vibriothrix* Castellani, 1917.

The mycelial articles are of different shape: bacillary, vibrio-like, spirillum-like and at times club-ended. Globular or pear-shaped bodies of variable sizes may be present. The organisms belonging to this genus are generally motile; gram-negative, not acid-fast; cultivable on ordinary mediums; most of them aerobic (facultative anaerobic), some anaerobic.

Type Species.—Vibriothrix zeylanica Castellani, 1910.

Synonyms.—Spirillum zeylanicum Castellani, 1910; *Vibrio zeylanicus* Castellani, 1913; *Bacillus zeylanicus* Castellani, 1913; *Vibriothrix*

Fig. 7.—Vibriothrix zeylanica (preparation from water of condensation of dextrose agar culture).

zeylanica Castellani, 1917; *Spirobacillus zeylanicus* Castellani, Spagnolo and Russo, 1918.

Remarks—Polymorphic organism, vibrio-like bacillus-like and undulating forms being often found in the same preparation; small, medium-sized and occasionally large roundish bodies are at times observed, and clublike forms may also be present.

The organism is motile, gram-negative and not acid-fast. It is grown easily on ordinary mediums. On potato the growth is often reddish. In broth there is often a pellicle; preparations from fluid mediums generally show a predominance of vibrio-like or bacillary forms, while in the pellicle long undulating forms are often found. On MacConkey's medium the colonies are white, and somewhat resemble those of the typhoid-dysentery group. The organism does not ferment any of the usual laboratory carbohydrates or alcohols: dextrose, levulose, galactose, maltose, lactose, saccharose, mannitol, dulcitol and raffinose. Frequently, in fact, there is production of alkalinity. Milk is not clotted

and is rendered alkaline, and certain strains after several weeks may induce a certain degree of peptonization. The great majority of strains are nonpathogenic to rabbits and guinea-pigs.

The germ was first isolated by me from cases of dysenteric enteritis in Ceylon, and has recently been observed by Spagnolo, Russo, Taylor, Douglas, Delamore and Alalon, Anigstein, Peruzzi and Ghiron, in Europe. Peruzzi and later Bhattacharzza have found that the organism has an ultramicroscopic phase.

The germ is found in great abundance in a number of cases of dysentery, while it seems to be rare in other conditions; it is doubtful, however, whether it can really become pathogenic, since I have found it also in cases in which the typical Shiga-Kruse bacillus was present. It may, perhaps, be considered a so-called "noso-parasite," as in the case of certain species of proteus found in cholera, typhus fever and other conditions.

An organism similar to *Vibriothrix zeylanica* has been found in cases of granular mycosis of the tonsils. Organisms somewhat similar to *V. zeylanica*, but some of them anaerobic, have been isolated from sputum by me and other observers.

ORDER II. THALLOSPORALES

The order *Thallosporales* Vuillemin, 1910—hyphales reproducing by means of thallospores—is divided into two suborders: *Blastosporineae*, in which reproduction takes place by means of blastospores, and *Arthrosporineae*, in which reproduction takes place by arthrospores.

The suborder *Arthrosporineae* would be important from a practical point of view, if the view of certain authorities were accepted, viz., that the *Trichophyton fungi* belong to it. I am inclined, however, to support the view that these fungi belong to *Ascomycetes* order *Aspergillales*, family *Gymnoascaceae* Baraketzky, 1872.

SUBORDER I, BLASTOSPORINEAE VUILLEMIN, 1911

The suborder *Blastosporineae*, contains five principal families:

1. *Cryptococcaceae* Kützing.
2. *Oosporaceae* Saccardo.
3. *Enantiothamnaceae* Chalmers and Archibald.
4. *Haplographiaceae* Saccardo.
5. *Cladosporiaceae* Saccardo.

They may be recognized as follows:

A. Hyphae not manifestly different from the spores.

I. Spores not in chains. Usually do not ferment carbohydrates with the production of gas—family 1, *Cryptococcaceae* Kützing, 1833.

II. Spores in chains. Usually ferment carbohydrates with the production of gas—family 2, *Oosporaceae* Saccardo, 1886.

B. Hyphae manifestly different from the spores.

I. Spores not in chains, but arranged verticillately—family 3, *Enantiothamnaceae* Chalmers and Archibald, 1915.

II. Spores in chains—family 4, *Haplographiaceae* Saccardo, 1886.

III. Spores in short chains or solitary—family 5, *Cladosporiaceae* Saccardo, 1886.

Family 1: *Cryptococcaceae* Kützing, 1833.

Definition.—*Blastosporineae* in which the hyphae are little different from the conidia, both being yeastlike in form. The conidia are entirely formed by gemmation from the hyphae and are never in chains.

Classification.—The family contains the following genera: *Torula* Persoon, 1801; *Cryptococcus* Kützing, 1833; *Pityrosporum* Sabouraud, 1895; and *Mycoderma* Persoon, 1822, which may be differentiated as follows:

A. Vegetative elements not elongate.

I. Nonpathogenic.

Vegetative elements roundish or oval, containing a large globule of fat; budding takes place, and often by several buds at the same time; pigment is present frequently; in fluid sugar mediums a thick pellicle, without bubbles of air, is slowly produced—*Torula.*

II. Pathogenic.

(*a*) Vegetative elements with well-developed double contour; no large globule of fat; budding takes place with single bud at a time; no thick pellicle on fluid sugar mediums; cultivated—*Cryptococcus.*

(*b*) Vegetative elements often without double contour; not cultivated—*Pityrosporum.*

B. Vegetative elements elongate.

In fluid sugar mediums a thick pellicle containing bubbles of gas is quickly produced—*Mycoderma.*

Cryptococcus Kützing, 1833.

Definition.—*Cryptococcaceae* with vegetative elements not elongate; pathogenic, with well developed double contour, but no globule of fat and only one bud at a time; usually no formation of thick pellicle on fluid sugar mediums; can be cultivated.

Type Species.—*Cryptococcus hominis* Vuillemin, 1901.

Cryptococcus dermatitis Gilchrist and Stokes, 1898. *Synonyms.*—*Blastomyces dermatitis* Gilchrist and Stokes, 1898; *Cryptococcus gilchristi* Vuillemin; *Zymonema gilchristi* Beurmann and Gougerot.

The fungus in the affected tissues appears as large globular cells, from 10 to 16 microns in diameter with double contour, reproducing by budding. In cultures, which are usually white, besides these globular

elements, rudimentary mycelial tubes may occasionally be found, presenting lateral or terminal conidia; asci are absent. The fungus does not ferment sugars, and a pellicle is not formed. Gelatin is not liquefied. There are probably several varieties of this fungus.

Cryptococcus hominis Vuillemin, 1901. *Synonyms.—Saccharomyces* (sp.?) Busse, 1894; *Atelosaccharomyces busse-buschki* of Beurmann and Gougerot, 1909; *Atelosaccharomyces rudeli* of Beurmann and Gougerot, 1911.

This organism was found in abscesses in a woman by Busse. In the pus the fungus presented itself in the shape of oval bodies, with a membrane which had a double contour. These elements were arranged in groups; each group was embedded in an amorphous substance and

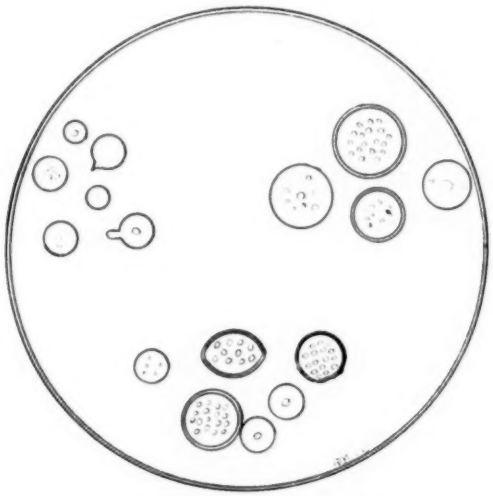


Fig. 8.—Cryptococcus hominis.

surrounded by a capsule. Culturally the fungus showed only roundish budding forms, no mycelium and no asci. Growth on solid mediums was generally white with at times a yellowish tinge. Gelatin was not liquefied. According to Sasagawa, this fungus produces acidity in glucose, levulose, mannibal and galactose. The organism was pathogenic to rabbits, white mice and dogs.

Cryptococcus epidermidis Castellani, 1914. Found by me in saccharomycosis or cryptococcosis epidermica; cells of variable size; has not yet been cultivated.

Cryptococcus farciminosus Rivolta and Miscellone, 1883. *Synonyms.—Cryptococcus tokishigei* Vuillemin; *Lymphosporidium equi* Gasperini, 1908; *Leukocytozoon piroplasmoides* Ducloux, 1908.

Definition.—Vegetative cells in situ, oval or roundish, with well marked double contour.

Remarks.—This organism is often included in hypertrophied endothelial cells and in leukocytes in the lesions in horses suffering from lymphangitis epizootica in Europe, Africa, Asia and America.

Cultivation.—It is difficult to cultivate. Nègre and Boquet have used with success a medium made of agar and dried horse dung. Sugar reactions are unknown.

Cryptococcus capsulatus Darling, 1906. *Synonym.—Histoplasma capsulatum* Darling, 1906.

Definition.—In the affected tissue the parasite appears in round or oval form, measuring from 1 to 4 microns in diameter and enclosed in an achromatic refractile capsule. Cultivation so far has been negative.

Remarks.—This organism was found by Darling in the endothelial cells of capillaries and small blood vessels in the lungs, spleen, liver, intestines and lymph glands, as well as in the leukocytes. It was considered by Darling and others to be a protozoon, and for it the genus *Histoplasma* was created. At present there is a consensus of opinion that it is a *Cryptococcus*.

Pathogenicity.—This fungus is pathogenic for man, causing disseminated, hyaline, pseudogranulomas in the lungs, splenomegaly, necrotic areas in the liver and ulceration of the small and large intestines.

Cryptococcus histolyticus Stoddard and Cutler, 1916. *Synonym.—Torula histolytica* Stoddard and Cutler. Found in a case of mycotic cerebrospinal meningitis (Freeman and Weidman); cultures yellowish. Produces acidity in glucose, maltose, saccharose and dextrine.

Cryptococcus ruber Demne, 1889. *Synonym.—Saccharomyces ruber* Demne, 1889.

This organism was found in the stools of children suffering from enteritis and also in certain specimens of milk.

It grows easily on ordinary laboratory mediums, producing red colonies. According to Casagrandi, it does not ferment any sugar.

Cryptococcus castellanii Re, 1925. *Synonym.—Monilia* (Sp.?) Castellani, 1924; *Monilia castellanii* Re, 1925. Isolated by me from peculiar cases of persistent furunculosis, not answering to staphylococcus vaccine.

Description (English cases).—Morphologically the organism is yeast-like, gram-positive and not acid-fast. The individual cells are somewhat rounded or oval. The maximum diameter of most cells is from 3 to 4 microns. The fungus is seldom detected microscopically in the pus of the boil-like lesions, staphylococci generally being present in large numbers; cultural methods are necessary; the cultures from

the pus, as a rule, resemble cultures of *Staphylococcus aureus*. It may be necessary to make a dozen or more preparations from what looks like a pure staphylococcus growth to find a few yeastlike cells. By plating and replating on dextrose agar mediums the fungus is finally isolated.

Cultural and Biochemical Characters.—The fungus grows abundantly on dextrose agar and grows also well, though less abundantly, on ordinary agar. The cultures on dextrose agar are at first white, but after a few days they show a characteristic yellowish or yellowish brownish pigmentation, with occasionally a purplish or reddish tinge. Gelatin and serum are not liquefied.

Lead agar is not darkened during the first two weeks; later a slight darkening may occasionally take place.

Sugar Peptone Waters.—The fungus when recently isolated has little or no fermentative action on any sugar; it may produce a slight acidity in dextrose and levulose, and occasionally a slight amount of gas. When the fungus has been transplanted several times its fermentative action is greatly increased, and it generally produces acid and gas in dextrose and levulose and occasionally slight acidity in galactose; it does not form gas in any other sugars (table 1).

Litmus Milk.—The medium is not clotted; a slight acidity may be present.

Agglutination.—The fungus is agglutinated by the patient's blood in certain cases up to 1 in 400.

Ascospores and Mycelium.—I have never observed asci even in extremely old cultures; mycelium in small amount is not rarely present in certain mediums, especially fluid mediums. A more complete description may be found in the *Journal of Tropical Medicine and Hygiene*, June 15, 1925.

Cryptococcus metaniger Castellani, 1926. Isolated by me from a peculiar variety of *Trichomycosis nigra*. The cells are rather elongated, and it is possible that further investigation will show that the fungus does not belong to the genus *Cryptococcus*. On glucose agar it produces a jet black growth. It differs from *C. niger* Vuillemin in that the cells are more elongated and that the cultures are black in all the ordinary laboratory mediums. *C. niger* Vuillemin was originally found by Muffucci and Sirleo in 1895 from a pulmonary myxoma of a guinea-pig. The cells in situ have a thick mucilaginous membrane. The growth was brown or black on potato, but white on most other mediums.

Cryptococcus pararoseus Castellani, 1926. Isolated by me from the sputum of patients in the tropics with chronic bronchitis. Grows well on all ordinary mediums. The growth has a smooth surface and is pink or pink-red. It produces slight acidity in glucose levulose.

Cryptococcus rubrorugosus Castellani, 1926. Isolated from scrapings of the skin of the axillary regions. Grows abundantly on all the usual laboratory mediums; the growth has a crinkled surface and is red or bright pink-red.

Cryptococcus graciloides Castellani, 1925. Isolated by me from cases of stomatitis cryptococcobacillaris in Central America. It is generally found living in symbiosis with *Bacillus B. vermiculoides* Castellani, 1925, from which it may be separated with difficulty.

This cryptococcus is a delicate yeastlike organism, gram-positive and not acid-fast. Each cell is roundish or more often oval, with frequently a flasklike shape. In preparations from the cultures the average maximum longitudinal diameter of most cells is from 3 to 4.5 microns, and the maximum average transverse diameter is from 2 to 3 microns.

Cultural and Biochemical Characters.—On dextrose agar, minute colonies somewhat streptococcus-like appear. On McConkey lactose agar there are minute colonies, but growth is often more abundant than on dextrose agar. In gelatin and serum growth is exceedingly scanty, and neither of the mediums is liquefied. With lead agar there is no evident darkening of the medium.

Sugar Peptone Waters.—There is no fermentation of any sugar, but it must be noted that the fungus grows scantily in these mediums and that sometimes there is no growth.[4]

Cryptococcus macroglossiae Castellani, 1925. In Ceylon during the period 1903-1915 I observed three cases of a peculiar type of macroglossia of blastomycetic origin. Two years ago an interesting case of macroglossia of the same type was referred to me in London by Dr. Broughton Alcock, and in this case, too, I isolated a yeastlike organism. A full account of the case from a clinical point of view will be given at an early date by Dr. Alcock and me.

Description of the Organism.—It is a yeastlike fungus, gram-positive and not acid-fast. The individual cells are oval and of rather large dimensions, the maximum diameter varying between 4 and 5 microns.

Cultural and Biochemical Characters.—On dextrose agar there is abundant growth, white, with a smooth surface. On ordinary agar there are the same characters as on dextrose agar, but they are less abundant. Glycerin and serum are not liquefied.

Sugar Peptone Waters.—The organism does not produce gas in any sugar or other carbohydrate. Rarely it may produce a slight amount of acidity in dextrose.

Litmus Milk.—In litmus milk there is no change.

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4. Castellani, Aldo: J. Trop. Med. **28**:217 (June 15) 1925.

Agglutination.—It is agglutinated by the patient's blood (1 in 400); not agglutinated, or only slightly so, by the blood of patients suffering from furunculosis blastomycetica.

Presence of Asci and Mycelium.—Asci have never been observed even in very old cultures; a little mycelium is not rarely visible in certain cultures, especially in fluid mediums. It would, therefore, probably be more correct to place this fungus in the genus *Monilia,* instead of the genus *Cryptococcus.* If it is placed in the genus *Monilia* it belongs to the zeylanica type (absence of gas in every sugar); it differs from *Monilia zeylanica* in not producing pigment, the cultures of *Monilia zeylanica* being yellow The correct name for the organism would be *Monilia macroglossiae* Castellani (synonym, *Cryptococcus macroglossiae* Castellani).

Remarks on Macroglossia Blastomycetica.—The whole tongue is greatly enlarged, occasionally painful; the patient feels discomfort in eating and may have some difficulty in speaking; he cannot whistle. It may be difficult to make the clinical diagnosis of blastomycetic macroglossia, as the tongue, though greatly enlarged, may show almost complete absence of the verrucoid patches so typical of blastomycosis. Deep scrapings should be made from the tongue after it is dried and painted with tincture of iodine, and cultures should be made. The observation of yeastlike organisms in superficial scrapings of the tongue is without importance, as these fungi are not rarely found in that situation even in normal mouths. Potassium iodide has a beneficial effect on the condition. Vaccines prepared with the fungus seem to be useful.

There are many other species of less known cryptococci. The following may be mentioned, none of which has been completely investigated biochemically.

Cryptococcus linguae-pilosae Lucet, 1901.
Cryptococcus plimmeri Costantin, 1901.
Cryptococcus degenerans Vuillemin, 1896.
Cryptococcus corsellii Neveu-Lemaire, 1908.
Cryptococcus hessleri Rettger, 1904.
Cryptococcus breweri Verdun, 1912.
Cryptococcus tonkini Legendre, 1911.
Cryptococcus sulfureus Beauverie and Lesieur, 1912.
Cryptococcus lesieuri Beauverie and Lesieur, 1912.
Cryptococcus salmoneus Sartory, 1911.
Cryptococcus niger Vuillemin.
Cryptococcus guillermondi Beauverie and Lesieur, 1912.
Cryptococcus harteri Beurmann and Gougerot, 1913.
Cryptococcus hudelo Beurmann and Gougerot, 1914.
Cryptococcus membranogenes Steinhouse, 1916.

Genus *Pityrosporum* Sabouraud, 1895.

Synonym.—Dermatophyton Dodd, 1910.

Definition.—Cryptococcaceae without well developed double contour.

Type Species.—Pityrosporum ovale Bizzozzero, 1882.

Remarks and Classification.—This genus, which is difficult to classify, is allied in appearance, in some forms, to a budding yeast, and as such comes close to *Cryptococcus*. So far, a species has not been cultivated, but two are known: viz., *P. ovale* Bizzozzero, 1882 (synonyms, *Saccharomyces capillitii* Oudemans and Pekelharing, 1885; *S. sphericus* Bizzozzero, 1884; *S. ovalis* Bizzozzero, 1889; *Pityrosporum malassezi* Sabouraud, 1895, often called the bottle bacillus of Malassez, in cases of pityriasis simplex capitis and pityriasis alba in Europe), and *P. cantlici* Castellani, 1908, in cases of seborrhea capitis in children in Ceylon.

They may be distinguished as follows:

A. Flask-shaped or oval, from 3 to 15 microns, but usually small—*Pityrosporum ovale.*

B. Generally roundish, from 5 to 16 microns, but usually large—*Pityrosporum cantlici.*

Family 2: *Oosporaceae* Saccardo, 1886.

Definition.—Blastosporineae in which the hyphae may be long or little different from the spores, which are typically in chains.

Classification.—This family is divided into several genera, the principal ones being *Oöspora* Wallroth, 1833, *Malbranchea* Saccardo, 1882, *Monilia* Persoon, 1797, and *Oidium* Link, 1809, which may be distinguished as follows:

A. Hyphae thin, short, simple or nearly simple.
   I. Terminating in chains of spores—*Oöspora.*
   II. Spores not in chains—*Malbranchea.*

B. Hyphae not thin, often long and branched.
   I. Sporophores simple or subsimple, typically with disjunction apparatus; dextrose completely fermented, gas being produced; numerous budding forms in cultures—*Monilia.*
   II. Sporophores simple, septate often with disjunction apparatus; dextrose not completely fermented, gas not being produced; budding forms rare or absent in cultures—*Oidium.*

These genera will now be briefly described.

Genus *Oöspora* Wallroth, 1833.

Definition.—Oösporaceae with a lax or compact mycelium in which the hyphae are slender, septate and marked by differentiated nuclei. The fertile hyphae are short, slender and nearly simple. The conidia, which

are globose or ovoidal, hyaline or brightly colored, are arranged regularly in chains.

Remarks.—Saccardo in his "Sylloge Fungorum" recognizes a large number of species as belonging to this genus, and these are grouped into sections by the varying color of the conidia.

The only species known to cause disease in animals referable to this genus is *Oöspora canina* Sabrazes, 1893, which causes favus in

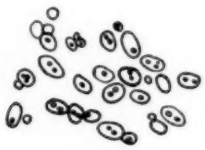

Figure 9

Figure 10

Fig. 9.—Monilia (preparation made from dextrose agar culture).
Fig. 10.—Monilia (preparation made direct from lesion).

Fig. 11.—Monilia (culture on dextrose agar).

dogs, and which can produce an eruption resembling ringworm when inoculated into man. According to Sabouraud, however, it has never been known to cause disease in man spontaneously (i. e., without experimental inoculation), and is, therefore, of little importance at present.

Vuillemin considers that *Achorion schoenleinii* Lebert, 1845, the fungus of favus of human origin, belongs to this genus.

The suggestion has been made that the fungi of tinea imbricata might also belong to this genus, rather than to the genus *Endodermophyton*.

Genus *Malbranchea* Saccardo, 1882. Spores are not in chains; arthrospores oval or cylindric and pinkish. The only species parasitic in man is *M. bolognesii-chiurcoi* Vuillemin, Pollacci and Nannizzi.

Genus *Monilia* Persoon, 1797.

Original Definition.—Stipitata and effusa byssoidea, Fila moniliformis articulata.

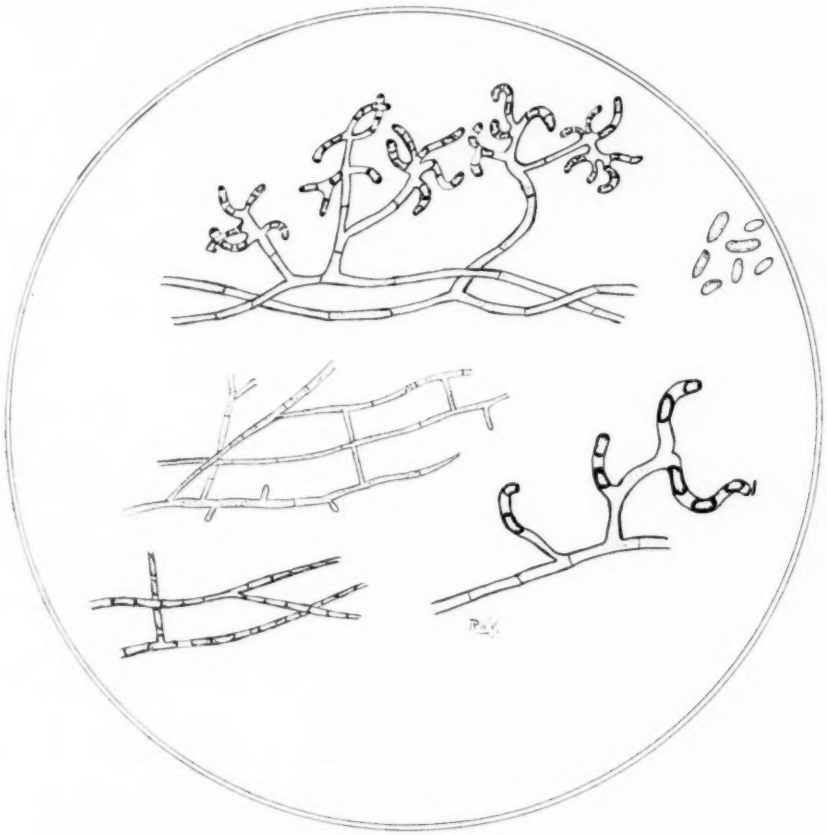

Fig. 12.—Malbranchea bolognesii—Chiurcoi, Vuillemin, Pollacci and Nannizzi (from Pollacci).

Botanic Definition.—Sporophores simple or subsimple, producing by constriction at their extremities a chain of large lemon-shaped conidia, often provided with a disjunction apparatus.

Usual Definition.—*Oösporaceae* possessing in situ budding forms and mycelial threads, which latter are often long and branched; in cultures mostly budding forms, but sometimes filaments, in which thallospores of the blastospore type are formed. Dextrose and often other carbohydrate mediums fermented with the production of gas.

Type Species.—It is difficult to know which is really the type species of this genus, but probably it is *Monilia aurea* Link, 1791.

Pathogenicity.—Fungi of this genus are the etiologic agents of thrush, some types of bronchomycoses and some dermatomycoses. It is practically impossible to differentiate the various species on morphologic grounds, and therefore, some years ago, I suggested a biochemical classification as follows:

1. Gas produced in dextrose only. *Balcanica Group.*—Principal species: *Monilia balcanica,* Castellani; *Monilia parabalcanica,* Castellani.

2. Gas produced in dextrose and levulose. *Krusei Group.*—Principal species: *Monilia krusei,* Castellani; *Monilia parakrusei; Monilia castellanii* Re. This is probably a cryptococcus.

3. Gas produced in dextrose, levulose and maltose. *Pinoyi Group.*—Principal species: *Monilia pinoyi* Castellani: *Monilia nabarroi* Castellani.

4. Gas produced in dextrose, levulose, maltose and galactose. *Metalondinensis Group.*—Principal species: *Monilia metalondinensis* Castellani; *Monilia pseudometalondinensis* Castellani.

5. Gas produced in dextrose, levulose, maltose, galactose and saccharose. *Tropicalis Group.*—Principal species: *Monilia tropicalis* Castellani; *Monilia metatropicalis* Castellani.

6. Gas produced in dextrose, levulose, galactose and saccharose. *Rhoi Group.*—Principal species: *Monilia rhoi* Castellani.

7. Gas produced in dextrose, levulose, maltose and saccharose. *Bronchialis Group.*—Principal species: *Monilia bronchialis.*

8. Gas produced in dextrose, levulose, saccharose and raffinose. *Guillermondi group.*—Principal species: *Monilia guillermondi* Castellani; *Monilia pseudoguillermondi* Castellani.

9. Gas produced in dextrose, levulose, galactose, saccharose and inulin. *Macedoniensis Group.*—Principal species: *Monilia macedoniensis* Castellani; *Monilia macedoniensoides* Castellani; *Monilia chalmersi* Castellani.

10. Gas produced in lactose and other carbohydrates. *Pseudotropicalis group.*—Principal species: *Monilia pseudotropicalis* Castellani, of which there are several varieties.

11. Gas produced in dextrin, in addition to other carbohydrates, but not in lactose. *Pseudolondinensis Group.*—Principal species: *Monilia pseudolondinensis* Castellani; *Monilia pseudolondinoides* Castellani; *Monilia africana* Macfie.

12. No gas produced in any sugar. *Zeylanica Group.*—Principal species: *Monilia zeylanica* Castellani; *Monilia zeylanoides* Castellani; *Monilia macroglossiae* Castellani.

It is important to note that many monilias after a few transplantations lose some of their fermentative characters or these are altered. Hence, the determination of species is possible only when recently isolated strains are used. There are, however, certain monilias as, for instance, *M. krusei, M. metalondinensis, M. tropicalis* and *M. macedoniensis,* which possess permanent biochemical characters.

TABLE 7.—*Biochemical Characters of Certain Monilias* *

	Dextrose	Levulose	Maltose	Galactose	Saccharose	Lactose	Mannitol	Dulcitol	Dextrin	Raffinose	Arabinose	Adonitol	Inulin	Sorbitol	Starch	Glycerin	Inositol	Salicin	Amygdalin	Isodulcitol	Erythrite	Gelatin	Serum	Litmus Milk	Color of Growth on Dextrose Agar
Monilia zeylanica Castellani	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	C	Yellowish
Monilia zeylanoides Castellani	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	White†
Monilia (Cryptococcus) macroglossiae Castellani	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	White‡
Monilia balcanica Castellani	G	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	White
Monilia parabalcanica Castellani	G	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	C	White
Monilia krusei Castellani	G	G	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	White
Monilia parakrusei Castellani	G	G	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	C	White
Monilia (Cryptococcus) castellanii Re	G	G	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Yellowish or reddish brownish
Monilia pinoyi Castellani	G	G	G	0	0	0	0	0	+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	White
Monilia nabarroi Castellani	G	G	G	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	C	White
Monilia metalondinensis Castellani	G	G	G	G	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	White
Monilia pseudolondinensis Castellani	G	G	G	G	0	0	0	0	G	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	White
Monilia alba Castellani	G	G	G	G	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	C	White
Monilia pseudolondinoides Castellani	G	G	G	G	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	C	White
Monilia africana Macfie, 1921	G	G	G	0	G	0	0	0	G	G	0	—	0	0	0	0	0	0	0	0	0	0	0	0	White
Monilia albicans Robin, emendavit Castellani and Chalmers	G	G	G	G	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	+	+	0	White
Monilia tropicalis Castellani	G	G	G	G	G	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	White
Monilia metatropicalis Castellani	G	G	G	G	G	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	C	White
Monilia rhoi Castellani	G	G	0	G	G	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	White
Monilia guillermondi Castellani	G	G	0	0	G	0	0	0	0	G	0	0	0	0	0	0	0	0	0	0	0	0	0	0	White
Monilia macedoniensis Castellani	G	G	0	G	G	0	0	0	0	0	0	0	G	0	0	0	0	0	0	0	0	0	0	C	White
Monilia macedoniensoides Castellani	G	G	0	G	G	0	0	0	0	0	0	0	G	0	0	0	0	0	0	0	0	0	0	0	White
Monilia chalmersi Castellani	G	G	0	G	G	0	0	0	0	0	0	0	G	0	0	0	0	0	0	0	0	0	0	0	Dark brown
Monilia bronchialis Castellani	G	G	G	0	G	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	White
Monilia pseudotropicalis I Castellani	G	G	0	G	G	G	0	0	0	0	G	0	0	0	0	0	0	0	0	0	0	0	0	C	White
Monilia pseudotropicalis II	G	G	0	G	G	G	0	0	0	0	0	0	G	0	0	0	0	0	0	0	0	0	0	0	White
Monilia pseudotropicalis III	G	G	0	G	G	G	0	0	0	0	0	0	G	0	0	0	0	0	0	0	0	0	0	C	White
Monilia pseudotropicalis IV	G	G	0	G	G	G	0	0	0	G	0	0	G	0	0	0	0	0	0	0	0	0	0	0	White

* G indicates production of gas; C, production of clot; 0, negative result; —, gas absent, no clotting.
† Does not produce any discoloration of lead agar.
‡ Produces black discoloration of lead agar.

Further details on classification of the various species of the genus *Monilia* may be found in the Manual of Tropical Medicine.[5]

Pathogenicity and Virulence.—The subcutaneous, intravenous or intrapulmonary inoculation of some monilias into rabbits does not produce any symptoms; other monilias are virulent and cause the death of the rabbit.[6] It is interesting to note that monilias with identical biochemical reactions may vary enormously in their virulence: some strains may be quite avirulent, while others are exceedingly virulent.

Genus *Oidium* Link, 1809, emendavit Pinoy.

Definition.—*Oösporaceae* with hyphae terminating in chains of spores; hyphae long and branched; sporophores simple, septate, often without disjunction apparatus; do not produce gas in carbohydrates.

Type Species.—*Oidium lactis* Link, 1809.

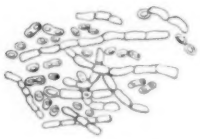

Figure 13

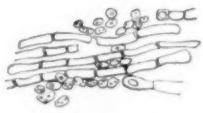

Figure 14

Fig. 13.—Oidium rotundatum (from a culture).
Fig. 14.—Oidium asteroides (from a dextrose agar culture).

Remarks.—Pinoy has adjusted this genus, so that now it contains human parasites, which are:

Oidium lactis Link, 1809.
Oidium rotundatum Castellani, 1911.
Oidium asteroides Castellani, 1914.
Oidium matalense Castellani, 1915.

These fungi may be differentiated as follows:

A. Produces only slight acidity, and only at times, in dextrose; cultures white —*Oidium lactis.*

B. Produce acidity in several carbohydrates.

I. No acidity in dextrose; culture white and hairy—*Oidium matalense.*

II. Acidity in dextrose.

(*a*) No acidity in mannitol. Mycelial spores, roundish or oval; typical colonies convoluted—*Oidium rotundatum.*

(*b*) Acidity in mannitol. Mycelial spores, quadrangular; typical colonies asteroid—*Oidium asteroides.*

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5. Castellani and Chalmers (footnote 3, p. 1081).

6. Castellani, Aldo: Fungi and Fungous Diseases: Lecture 2 (Bronchomycoses), Arch. Dermat. & Syph., to be published.

FAMILY 3: *Enantiothamnaceae* Chalmers and Archibald, 1915.

Definition.—*Blastosporineae* with a thallus composed of ramifying hyphae, with regular septums, which easily disappear, thus dissociating the segments, which are from 2 to 2.5 microns broad. The conidia are arranged verticillately around the septum.

Remarks.—This family contains only one genus, Enantiothamnus Pinoy, 1911.

Genus *Enantiothamnus* Pinoy, 1911.

Definition.—Enantiothamnaceae with the characters of the family.

Remarks.—There is only one species so far known, *Enantiothamnus braulti* Pinoy, 1911.

Enantiothamnus braulti Pinoy, 1911. *Definition.*—*Enantiothamnus* with oval conidia from 2 to 2.5 by from 1 to 1.5 microns.

Habitat.—Parasitic in man.

Remarks.—This fungus was discovered in an Arab in Algiers by Brault in umbilicated tumors containing pus, in the gluteal region.

On Sabouraud's agar the colonies are white, with a yellowish central portion.

Pathogenicity.—The organism produces tumors and pus in man, and is pathogenic for guinea-pigs.

FAMILY 4: *Haplographiaceae* Saccardo, 1896.

Definition.—*Blastosporineae* with hyphae manifest and distinct from the conidia, which are usually arranged in chains, or, in parasitic condition in man, in grapelike masses.

Remarks.—This family contains the general *Hormodendrum* Bonorden, 1851, and *Malassezia* Baillon, 1889, which are recognizable as follows:

All sterile hyphae creeping. Conidia all alike and produced on the hyphae. Conidiophores not spirally twisted; hyphae dendroid.

A. Conidia in cultures in chains, in parasitic form in masses—genus *Hormodendrum* Bonorden, 1851.

B. Conidia in parasitic form in masses; cultural form unknown—genus *Malassezia* Baillon, 1889.

Genus *Hormodendrum* Bonorden, 1851.

Definition.—*Haplographiaceae* with creeping dendroid sterile hyphae and branched conidiophores, bearing conidia all of one kind.

Remarks.—The genus *Hormodendrum* contains about ten species, which are generally parasitic on plants or saprophytic, but one is known to occur in man, viz., *H. fontoynonti.*

Type Species.—*Hormodendrum olivaceum* Corda, 1838.

Hormodendrum Fontoynonti Langeron, 1913. *Definition.*—*Hormodendrum* in cultures with sterile hyphae from 3 to 8 microns in diameter, greenish brown, septate with thick walls. The sporophores are well defined and not swollen at the extremity, and they carry chains of caducous spores. In man the mycelium is broken into long and undulating segments; spores, which are capable of budding, are arranged in masses.

Remarks.—This organism was found by Fontoynont and Carougeau in the scales of a dermatosis called "hodi-potsy" in Madagascar, which is comparable to that termed "tinea flava" in other tropical countries. It is doubtful whether the fungus is the etiologic agent of the condition.

Genus *Malassezia* Baillon, 1889.

Definition.—In man, mycelium broken into septate segments, with T-shaped or budding extremities. The hyphae carry round or oval

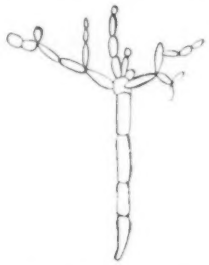

Fig. 15.—Hormodendrum.

conidia, which may be solitary or in grapelike masses, and may be smooth or with longitudinal, radial or spiral marks. Cultivation has not yet succeeded.

Remarks.—This genus is known only to contain parasites of man. The two species may be recognized as follows:

A. Causing a brown eruption on the white skin, i. e., tinea versicolor; lesions superficial—species *Malassezia furfur* Charles Robin, 1853.

B. Causing a reddish yellow eruption on the white skin and a light yellow eruption on the dark skin, i. e., tinea flava; deeper lesions—species *Malassezia tropica* Castellani, 1905.

Family 5: *Cladosporiaceae* Saccardo, 1886.

Definition.—Blastosporales with hyphae manifest and distinct from the conidia, which are either solitary or arranged in short chains.

Remarks.—Only the type genus *Cladosporium* Link need be considered; it may be recognized as follows:

Conidia smooth, not capitate, more or less in chains at first; hyphae and conidia uniform; hyphae not inflated, but decumbent; conidia in short chains and finally solitary—genus *Cladosporium* Link, 1809.

Genus *Cladosporium* Link, 1816.

Definition.—*Cladosporiaceae* with decumbent hyphae; conidiophores bearing smooth, uniform conidia arranged in short chains or solitary.

Remarks.—The type species is *Cladosporium herbarium* Persoon, 1801. A large number of species are scattered all over the world. They are commonly found on plants in tropical gardens, from whence the spores can easily be conveyed to the human skin, and either grow there, causing a lesion, or simply remain sheltered among the scales of other lesions, from which they may be grown in pure culture, thus giving rise to the impression that they may be causal organisms; however, they do not agglutinate with the patient's serum.

They may also grow as contaminations of laboratory mediums, so commonly may their spores be found in the air. The two species known in man may be recognized as follows:

A. Habitat, tinea nigra—species *Cladosporium mansoni* Castellani, 1908.

B. Habitat, ulcerating nodules—species *Cladosporium penicilloides* Gueguen, 1911.

Suborder II. Arthrosporineae Vuillemin, 1910

Definition.—Thallosporales with yeastlike forms, associated in cultures with hyphae and other forms with longer hyphae. Reproduction by means of arthrospores parasitic on man.

Remarks.—Vuillemin includes in this suborder the genera *Trichophyton, Microsporum, Achorion* and their allies, although it is more usual to consider these to be allied to the *Gymnoascaceae,* because *Ctenomyces serrata* Eidam, 1880, when injected into animals, develops a trichophyton-like mycelium and eruption, which classification has recently been supported by the work of Marshall and Chalmers on *T. currii.* However, for the present, it is proposed to leave these genera and their allies out of consideration.

Classification.—This suborder contains the following genera:

A. Producing piedra on hairs—genus *Trichosporum* Behrend, 1890.

B. Producing black maduromycosis—genus *Madurella* Brumpt, 1905.

C. Producing white maduromycosis—genus *Indiella* Brumpt, 1906.

Genus *Trichosporum* Behrend, 1890.

Definition.—Arthrosporales living parasitically on the hairs of man in the form of large, oval or roundish bodies embedded in a ground substance. In cultures elongated hyphae and spores are formed.

Remarks.—Care must be taken not to confuse *Trichosporum* Behrend, 1890, with *Trichosporium* Fries, 1849, a very different genus with over forty species, mostly saprophytic.

The species of this genus give rise to nodosities on hairs. They are:

T. giganteum Behrend, 1890, the cause of piedra in hairs of the head, in Colombia.

T. beigeli Rabenhorst, 1867, the cause of piedra in the hairs of the beard, in Europe.

T. ovoides Behrend, 1890, the cause of piedra, in hairs of the moustache.

T. ovale Unna, 1896, on the hairs of the moustache in Europe.

T. glycophile du Bois, 1910, on the pubic hairs of a diabetic patient.

The various species may be differentiated as follows:

A. Bodies around hair polyhedral.
   I. Diameter of bodies from 12 to 15 microns—*Giganteum.*
   II. Diameter of bodies from 3 to 4 microns—*Beigeli.*

B. Bodies around hair oval and small, from 3 to 4 by from 1.5 to 2.5 microns.
   I. In cultures hyphae often twisted like a corkscrew—*Ovale.*
   II. In cultures hyphae not so twisted—*Ovoides.*

C. Bodies around hair roundish, from 3 to 4 microns in diameter. Fungus associated with a coccus, with which it grows well on sugar mediums—*Glycophile.*

These fungi live as parasites on the surface of the hairs, but do not penetrate into their interior; during the parasitic life they vegetate in the shape of large oval or roundish elements, embedded in an amorphous substance. Saprophytically (cultures), they vegetate, forming mycelial threads and spores.

Genus *Madurella* Brumpt, 1905, emendavit Pinoy, 1912.

Definition.—Arthrosporineae with sterile septate hyphae, reproducing the thallus by fragmentation and secreting a black pigment. The spores are produced secondarily by binary division of the articles. They are found in black maduromycosis and grow well at 37 C.

Type Species.—Madurella mycetomi Laveran, 1902.

The principal species may be recognized as follows:

A. Sclerotia from 0.5 to 1 mm. in diameter formed in the depths of medium in cultures—*Mycetomi.*

B. Sclerotia rarely produced, and then on the surface of the medium—*Tozeuri.*

C. Numerous sclerotia on surface—*Americana* (Gammel).

Genus *Indiella* Brumpt, 1906.

Definition.—Arthrosporineae with septate, ramified hyphae, without black pigment, and hence sclerotia white or yellowish.

Type Species.—Indiella mansoni Brumpt, 1906.

Remarks.—White thallus, living as a parasite in various animal tissues—connective tissue, muscles and bones. Mycelial threads from 1 to 8 or 10 microns, septate, ramified, never secreting—in contrast to the fungi of genus *Madurella*—any black pigment. Masses of

mycelial threads form sclerotia-like bodies or grains of various shape containing chlamydospores.

Classification.—The species may be recognized as follows:

A. Sclerotia hard and bean-shaped—*Mansoni.*
B. Sclerotia soft and in coiled masses.—*Reynieri.*

ORDER III. HEMISPORALES VUILLEMIN, 1910

Definition.—Hyphales with the mycelium composed of abundant hyphae, thin, but more than 1 micron in diameter, septate and branched conidiophores ramified basally, each branch terminating in a protoconidium, preceded by an annular construction produced by a brown, rigid thickening of the wall. The protoconidium is transformed completely or partially into deuteroconidia, but occasionally it elongates, forming a new conidiophore, or puts out branches which are capable of becoming conidiophores.

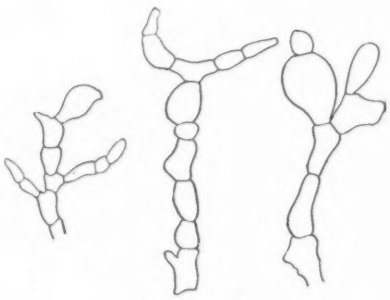

Figure 16

Figure 17

Fig. 16.—Madurella mycetomi (after Brumpt).
Fig. 17.—Hemispora stellata (after Vuillemin).

Classification.—There is only one genus, *Hemispora* Vuillemin, 1906.

Genus *Hemispora* Vuillemin, 1906.

Definition.—Mycelial filaments, thin, hyaline, septated, ramified. Some mycelial filaments show an ampulliform structure (protoconidium), which later divides into several sporelike segments (deuteroconidia).

The genus contains two species: asteroid colonies—asteroides, cerebriform—rugosa.

ORDER IV. CONIDIOSPORALES VUILLEMIN, 1910

Definition.—Hyphales with the mycelium composed of abundant hyphae, more than 1 micron in diameter, septate and branched, with or without true conidiophores, and with reproduction by means of true conidia.

Remarks.—The reasons for the formation of this order, which contains a large number of families, have already been given, as well as its advantage over the more fully worked out system of Saccardo.[7]

Classification.—The order *Conidiosporales* is divided into five suborders, which may be recognized as follows:

A. *Conidium imperfect:* Aleuriospore.
Suborder 1: *Aleuriosporineae* Vuillemin, 1911.

B. *Conidium perfect:* Conidium verum.

I. True conidiophores absent:
Suborder 2: *Sporotrichineae* Vuillemin, 1910.

II. True conidiophores present:

(*a*) Conidia borne on sporophores.
Suborder 3: *Sporophoralineae* Vuillemin, 1910.

(*b*) Conidia borne on phialides.

1. Prophialides absent.
Suborder 4: *Phialidineae* Vuillemin, 1910.

2. Prophialides present.
Suborder 5: *Prophialidineae* Vuillemin, 1910.

The fourth suborder, *Phialidineae,* contains species of the genera *Aspergillus* Micheli, 1729, *Penicillium* Link, 1809, and *Sterigmatocystis* Cramer, 1859, in which asci are unknown; but though logically correct to include these species in the *Fungi imperfecti,* it is more convenient to consider them under the heading *Ascomycetes,* though the genus *Scopulariopsis* may be placed here.

The last suborder, *Prophialidales,* does not contain any genera with species parasitic in man.

Suborder I. Aleuriosporineae Vuillemin, 1911

Definition.—Conidiosporales in which reproduction takes place by aleuriospores.

Classification.—The suborder contains two families, which can be distinguished as follows:

A. Conidiophores absent—*Aleurismaceae.*

B. Conidiophores present—*Monotosporaceae.*

Family *Aleurismaceae* Vuillemin, 1911.

Definition.—*Aleuriosporineae* without conidiophores.

Classification.—The family is divided into two tribes:

A. Spores simple or appendiculate—*Aleurismeae.*

B. Spores bicellular or multicellular—*Blastotricheae.*

Only the first tribe is of interest to us.

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7. Castellani and Chalmers (footnote 3, p. 1037).

Tribe Aleurismeae.

This tribe may be classified as follows:

A. Hyphae pale.
- I. Hyphae short; sporogenous; apparatus but little differentiated from the mycelium—*Myceliophthora* Costantin, 1894.
- II. Hyphae elongate, sporogenous apparatus but little differentiated from the mycelium—*Acladium* Link, 1809.
- III. Hyphae elongate, a sporogenous apparatus well differentiated from the mycelium.
  - (*a*) Aleuriospore, smooth, small, acropleurogenous.
    1. Aleuriospores colored—*Aleurisma* Link, 1809.
    2. Aleuriospores pale—*Corethropsis* Corda, 1839.
  - (*b*) Aleuriospore, large, spiny, acrogenous.
    1. Aleuriospore, appendiculate *Mycogone* Link, 1809.
    2. Aleuriospore nonappendiculate—*Sepedonium* Link, 1809.

B. Hyphae dark.
- I. Hyphae pale and dark; aleuriospores become dark and acropleurogenous on light or dark hyphae, small, generally 6 by 4, rarely 11 by 5, microns—*Glenospora* Berkeley and Curtis, 1876.
- II. Hyphae dark; aleuriospores remain hyaline, situated acrogenously on hyaline hyphae at the base of sterile dark hyphae, large, from 11 to 14 microns—*Botryotrichum* Saccardo and Marchal, 1885.

Genus *Acladium* Link, 1809.

Definition.—*Aleurismeae* with pale elongate hyphae and with sporogenous apparatus, but little differentiated from the mycelium; sporophores unbranched; conidia pleurogenous.

Type Species.—*Acladium conspersum* Link, 1809.

Remarks.—There is only one species parasitic in man; viz., *A. castellanii.*

Acladium castellanii Pinoy, 1916. *Definition.*—*Acladium* with small chains of acrogenously placed chlamydospores. The aleuriospores are acropleurogenous.

Remarks.—The parasite was found by me in cases of ulcerative dermatitis, with gumma-like nodules, in Ceylon, the Federated Malay States and Macedonia, and it was fully described by Pinoy.

The growth on artificial mediums (such as carrot, potato and dextrose agar) consists of many small roundish masses, which later on may coalesce. They are covered by spiculated formations, which give them a prickly appearance, and consist of erect, straight filaments, parallel to each other, or at times interlacing. These filaments are approximately 2 microns in diameter, and carry laterally pseudoconidia of variable shape, cylindriform, pyriform or spherical, attenuated in size at their points of insertion. Most of these pseudoconidia are 4 microns in length, with a breadth of 3 microns. This type of fructification recalls the type *Acladium* described by Bodin in certain species of the genus *Trichophyton* Malmsten, 1848.

These pseudoconidia become detached and then develop by sprouting, and mycelial filaments are formed. Certain filaments produce spherical chlamydospores arranged in small strings, as found in certain fungi of the genus *Fusarium*. These small chains of chlamydospores are frequently terminal, the dimensions being variable from 8 to 10 microns.[8]

In cultures on carrot and potato the colonies are white, on dextrose agar often amber. Old cultures may show a certain amount of pigmentation, brown or black, especially on potato.

Genus *Glenospora* Berkeley and Curtis, 1876.

Definition.—*Aleurismeae* with pale and dark hyphae. Aleuriospores become dark, and are situated acropleurogenously on light or dark hyphae, but are small, being generally 6 by 4 microns in diameter and rarely 11 by 5 microns.

Type Species.—*Glenospora curtisii* Berkeley and Desmond.

Classification.—Besides the type, *G. ramorum* Schweinitz, 1822, several pathologic species are known. The latter are:

G. graphii (Siebenmann, 1889, found in cases of otomycosis and keratomycosis).

G. sacchari Spegazzini, 1896, in the Argentine.

G. microspora Spegazzini, 1891, in Brazil.

G. khartoumensis Chalmers and Archibald, 1916, found in black maduromycosis.

G. semoni Chalmers and Archibald, 1917.

The various species may be recognized as follows:

A. Aleuriospores large, usually measuring 10 or more microns in diameter: Parasitic on plants—(1) *Curtisii*, (2) *Ramorum*.

B. Aleuriospores medium, measuring 6, 8, 9 or 11 microns; (3) *Sacchari*. Parasitic on plants—(4) *Microspora*.

C. Aleuriospores small, usually measuring 5 or less microns in diameter.

I. Parasitic in man, causing otomycosis and keratomycosis—(5) *Graphii*.

II. Parasitic in man, causing black maduromycosis.

(*a*) Growth on clear maltose agar twelve days, uncapped tube at 30 C.; central black rounded mass surrounded by an abundant white fringe—(6) *Semoni* (in India).

(*b*) Growth in exactly same conditions as in (*a*); central series of small elevations from which radiate furrows cutting in black plateau; fringe slightly marked—(7) *Khartoumensis* (in Africa).

Genus *Trichothecium* Link, 1824.

Fertile hyphae are erect, grouped together, each terminating in an oval, pear-shaped or globular conidium. The only species so far observed in man is *Trichothecium roseum*.

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8. Castellani and Chalmers (fotnote 3, figs. 595-597).

Type.—Trichothecium roseum Persoon, 1801, emendavit Link, 1824.

Trichothecium roseum Persoon, 1801. *Synonyms.—Trichoderma roseum* Persoon, 1801; *Sporocephalum roseum* Persoon, 1801; *Puccinia rosea* Corda, 1837.

This species vegetates on decaying vegetable matter; the color is at first white, then pinkish. Each fertile hypha terminates in a pear-shaped conidium, from 10 to 20 microns in length and from 8 to 12 microns in breadth.

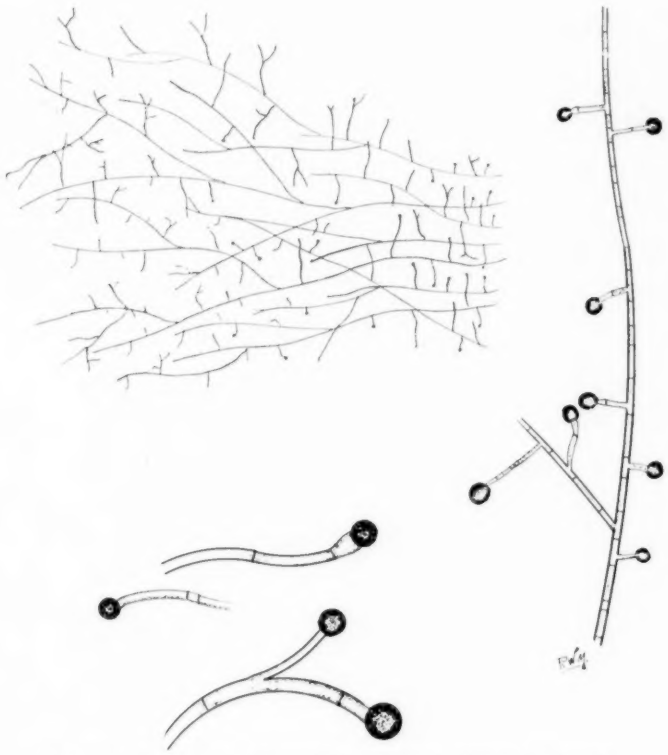

Fig. 18.—Acremoniella perinii Pollacci (from Pollacci).

This fungus has been found in cases of otomycosis by Stendener, who did not succeed in cultivating it. Some authorities believe it to be identical with *Glenospora graphii.*

Genus *Acremoniella*

In cultures, abundant, septate mycelium; each conidiophore bears a terminal dark brown spore from 7.7 to 9.7 microns in diameter.

Suborder II. Sporotrichineae Vuillemin, 1910

Definition.—Conidiosporales in which reproduction takes place by means of true conidia, but in which true conidiophores are absent.

Type Genus.—*Sporotrichum* Link, 1809, which has a large number of species scattered over the world, of which 100 are described in Saccardo's "Sylloge Fungorum," volume IV.

Genus *Sporotrichum* Link, 1809, emendavit Saccardo, 1882.

Synonyms.—*Miainomyces* Corda; *Chromelsporium* Corda.

Definition.—Sporotrichales with the characters of the suborder.

Human Species.—There has been considerable discussion as to whether the human species belonged to this or another genus, e. g., *Oöspora, Botrytis, Trichosporum, Rhinocladium* or *Torula,* but Smith,

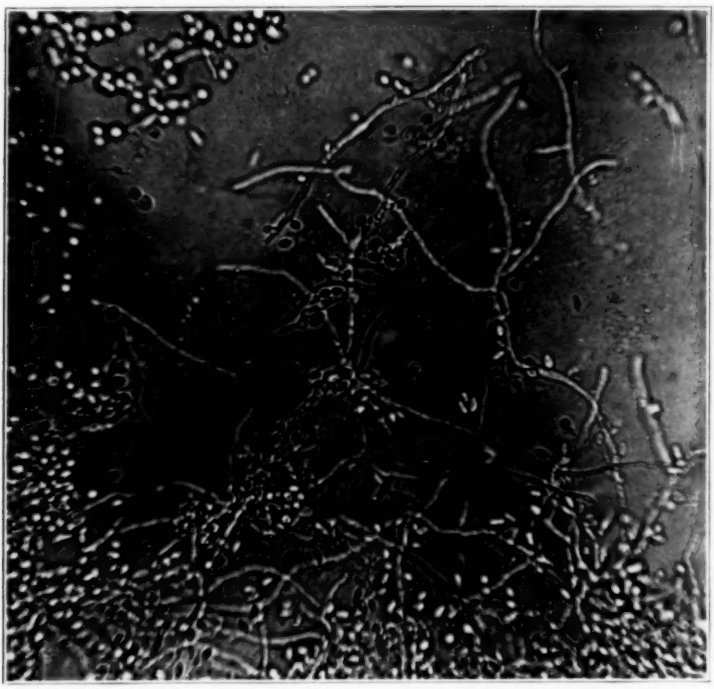

Fig. 19.—Sporotrichum schencki (courtesy of Dr. E. M. Johns).

de Beurmann and Gougerot's belief that *Sporotrichum* is the correct genus has been supported by Matruchot, Vuillemin and Pinoy, and may be considered as settled as far as the present knowledge goes.

The first species ever associated in any way with man was, *Sporotrichum inquinatum* Link, 1809, which was found growing on dry human feces. This was probably a saprophyte. The first ever found in diseased men was *Sporotrichum bronchiale* Montagne, 1844. It was discovered by Gubler in the bronchi of sick persons.

Species Parasitic in Man.—It is customary at present to give the following species as parasitic in man, and it may be noted that they do

not correspond to any known species living saprophytically or parasitically on plants:

1. *S. schencki* Hektoen and Perkins, 1900.
2. *S. beurmanni* Matruchot and Ramond, 1905.
3. *S. dori* de Beurmann and Gougerot, 1906.
4. *S. indicum* Castellani, 1908.
5. *S. asteroides* Splendore, 1908.
6. *S. gougeroti* Matruchot, 1910.
7. *S. jeanselmi* Brumpt and Langeron, 1910.
8. *S. lesnei* Vuillemin, 1910.
9. *S. councilmani* Wolbach, Sisson and Meier, 1917.

And one may add:

10. *S. bronchiale* Montagne, 1844.

There is, however, some difference of opinion with regard to some of these species; thus, de Beurmann and Gougerot consider that the

Fig. 20.—Sporotrichum (after Gougerot).

fourth and fifth are only varieties of the second, and many authorities (Davis, Hektoen, and others) consider that there are only two valid species: *S. schencki*, and *S. councilmani*, which may not even be a sporotrichum.

Considering them all provisionally as separate species, they may be recognized as follows:

A. Conidia large (from 4 to 11 microns in greatest diameter), with well developed pedicle and presence of lateral spore clusters:

Mycetomas in Madagascar—*Lesnei*.

Conidia large with absence of lateral spore clusters:

Traumatic arthritis in America—*Councilmani*.

B. Conidia usually small with short pedicle, which may be absent.

I. With radiating bodies; conidia polymorphic, round, oval or bacilliform, varying from 4 to 8 microns in greatest diameter—*Asteroides*.

II. Without radiating bodies.

(*a*) Conidia not numerous; ferments lactose, not saccharose—*Schencki*.

(*b*) Conidia numerous.

1. Hyphae 2 or more microns in diameter.
   (A) Cultivated.
      (1) Colonies dark from the first—*Gougeroti.*
      (2) Colonies whitish at first.
         (1^1) Colonies finally black; ferments saccharose, not lactose—*Beurmanni.*
         (2^1) Colonies lightish brown—*Dori.*
         (3^1) Colonies whitish gray to black; hyphae wide, from 3 to 4 microns—*Indicum.*
   (B) Not cultivated; hyphae from 5 to 7 microns in diameter—*Bronchiale.*
2. Hyphae less than 2 microns in diameter; hyphae from 0.5 to 1 micron in diameter—*Jeanselmi.*

Pathogenicity.—These species usually give rise to lesions in the skin and deeper tissues that resemble those of tertiary syphilis (gummas, etc.) or tuberculosis, but *S. lesnei* produces a disease like mycetoma.

Suborder III. Sporophorineae Vuillemin, 1910

Definition.—Conidiosporales reproducing by true conidia borne on conidiophores.

Remarks.—A number of families and a large number of genera are included in this suborder, but one is concerned with only four, which may be separated from one another as follows:

A. Conidiophores unbranched.
   I. Single hyaline or lightly colored terminal spore—*Acremonium* Link, 1809.

B. Conidiophores branched.
   I. Conidiophores erect—*Monosporium* Bonorden, 1851.
   II. Conidiophores decumbent—*Scedosporium* Saccardo, 1911.

Monosporium is mentioned only because *Scedosporium apiospermum* used to be *Monosporium apiospermum.*

Genus *Acremonium* Link, 1809.

Definition.—*Sporophorineae* with creeping sterile hyphae but little branched, and carrying laterally simple unbranched conidiophores, broad in the middle and gradually reduced toward the distal extremity, terminating in a single hyaline or lightly colored spore.

Type Species.—*Acremonium alternatum* Link, 1809.

Remarks.—A small number of species are known, which for the most part live saprophytically on decaying wood, leaves, etc. Two species only are known in man.

Acremonium petroni Vuillemin, 1911. Found by Potron and Noisette in a case of subcutaneous gummas with fever, which had somewhat resembled typhoid before the gummas appeared; easily grown on Sabouraud's agar; colonies white, then pinkish and, later, orange yellow; serum is liquefied. In cultures the mycelial filaments are septated; numerous conidiophores of a peculiar elongated type, from 15 to 20 microns in length, are present; conidia ovoid, with a smooth surface, from 4 to 5 microns in length and from 2 to 2.2 microns in breadth; pinkish. This fungus is pathogenic to guinea-pigs.

Acremonium niveum Boucher, 1918. Similar to *A. petroni*, but colonies are generally white.

Genus *Scedosporium* Saccardo, 1911.

Definition.—Sporophorineae with unbranched decumbent conidiophores.

Type Species.—*Scedosporium apiospermum* Saccardo, 1911.

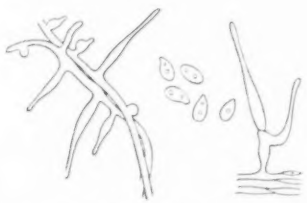

Fig. 21.—Acremonium petroni Vuillemin, 1911 (after Vuillemin).

Remarks.—The other known species are *Scedosporium acremonioides* Harvey, which is of no concern here, and *S. sclerotiale*.

Scedosporium apiospermum Saccardo, 1911. *Definition.*—*Scedosporium* with mycelium at first white and later slightly brown; bundles from 3 to 5 mm. broad in cultures; mycelial hyphae creeping, filiform; conidiophores decumbent, slightly branched, hyaline, from 2.5 to 3 microns, with one spore oblong, from 14 by 5.6 to 11 by 5.7, rarely subround; at first hyaline, later dilute, dirty rose yellow. *Scedosporium*, causing white maduromycosis.

Remarks.—Easily grown, the cultures are whitish and covered with duvet; may become brownish when old.

Mycelial tubes septated and of various size; may reach from 4 to 5 microns in breadth. Each conidiophore supports a terminal spore, which is either ovoid, from 12 to 14 microns in length, and from 5 to 6 microns in breadth, or roundish, from 6 to 7 microns in diameter. Other kinds of fructification are not seen.

Pathogenicity.—This fungus has been found in Italy, by Tarozzi and Radaeli, in cases of mycosis of the foot resembling madura foot.

Radaeli described it as a new species of the genus *Monosporium*. Saccardo placed it later in the genus *Scedosporium*. Radaeli made a complete pathologic and clinical investigation of the condition.

Scedosporium Sclerotiale Pepere, 1914. *Synonym.—Monosporium sclerotiale seu nigricans* Pepere, 1914.

Definition.—Scedosporium causing black maduromycosis.

Remarks.—This fungus resembles *S. apiospermum*, with the exception that it produces black pigment. It was ably investigated by Pepere, who grew it on various mediums, studied it mycologically, studied complement fixation with it and finally obtained successful inoculations in the anterior chamber of the eye in guinea-pigs.

Pathogenicity.—It was found in a case of black maduromycosis in a peasant, aged 33, who lived at Domusnovas, in the province of Cagliari, in Sardinia.

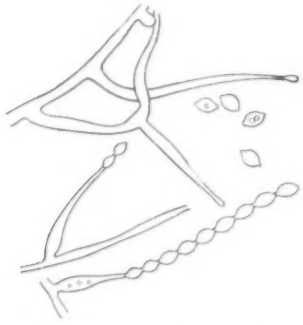

Fig. 22.—Scopulariopsis blochii Matruchot (after Vuillemin).

Suborder IV. Philidineae Vuillemin, 1910

Definition.—Conidiosporales with conidia borne on phialides.

Remarks.—As already stated, the species of *Aspergillus, Sterigmatocystis* and *Penicillium* in which asci are known could be classified here, but we will consider only *Scopulariopsis*, which is closely related to *Penicillium*.

Genus *Scopulariopsis* Bainier, 1907.

Synonym.—Penicillium pro parte.

Definition.—Phialidalineae resembling *Penicillium*, with unbranched erect conidiophores, bearing phialides, which carry a chain of large ovoid or roundish spores.

Type Species.—Scopulariopsis brevicaulis Saccardo, emendavit Bainier, 1907.

Remarks.—In addition to those found in man, *S. rubellus* Bainier, 1907, *S. rufulus* Bainier, 1907, *S. repens* Bainier and *S. communis* Bainier are known.

Species Found in Man.—Two species are found in man, which may be differentiated as follows:

A. With white creamy formation in old cultures—*Blochi.*

B. Without such formations in old cultures—*Komingii.*

(To be Continued)

LIVEDO RETICULARIS *

MICHAEL HIGGINS EBERT, M.D.
CHICAGO

A transient livid mottling of the extremities, less often of the trunk, on exposure to a moderate degree of cold, is so common, especially among children, as to be considered almost physiologic.

This so-called livedo e frigore, or cutis marmorata, is believed by some [1] to be due to a passive congestion in part of the peripheral capillary circulation. According to Unna, the islands of normal color are the bases of inverted cones, the apexes of which are the nutrient arteries of the cutis. The livid bands lie along the lines of intersection of these cones. The capillary circulation here is entirely collateral, and the pressure is at a minimum.

In persons who are subject to cutis marmorata, Unna assumes an increased tonus of the muscles in the walls of the veins. When the skin is chilled in these persons, there is a reflex spasm of the nutrient arteries and consequent syncope of the bases of the cones of distribution. The livid bands, corresponding to areas of minimum pressure, are stagnant, owing to the contraction of the veins. Brisk rubbing causes these livid bands to disappear temporarily. When the skin becomes warm, the whole pattern soon fades.

There is no unanimity of opinion, however, concerning the etiology of this phenomenon. Ehrmann [2] agrees with Spalteholz that there is no anatomic evidence to substantiate Unna's explanation. He states that livedo affects only the superficial capillary network. The capillaries in equidistant areas are in a state of hypertension. The capillaries in intervening areas are atonic, and hence become filled with a slowly moving column of blood, which is then cooled and deoxidized, since there is no corresponding dilatation of the nutrient arterioles.

Mayr List [3] has demonstrated that the livid bands of cutis marmorata always recur in exactly the same area, and he claims that these areas are the sites of the nerve endings for the sensation of cold.

The stability of the pattern suggests that it is related to an anatomic background, as Unna has explained. In the light of more modern,

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*From the Department of Dermatology, Rush Medical College.

1. Unna: The Histopathology of the Diseases of the Skin (trans. by Norman Walker), in Renaut: Dictionnaire encylopedique des sciences medicale, New York, The Macmillian Company, 1883, vol. *28*, p. 158.

2. Ehrmann: Mracek Handbuch der Hautkrankheiten, Vienna, Alfred Holder, 1902, vol. 1, p. *336*.

3. List, Mayr: Arch. f. Klin. Med. **148**:67, 1925.

intensive study of the anatomy and physiology of the capillaries, as outlined by Krogh,[4] any theory explaining cutis marmorata and the subsequent development of a permanent livedo must be revised.

Krogh and Vimtrup have shown, by means of studies with the capillary microscope and other exact physiologic methods, that the capillaries and venules of the skin are regulated by nervous impulses, independently of the arterioles; that they respond directly to external stimulants such as heat, cold, light and mechanical irritation, and that, given a sufficient oxygen tension, they are maintained in a state of normal tonus by a hormone X, which is probably identical with pituitary extract. Under normal conditions only a portion of the capillary loops are dilated and filled with blood at any one time in any given field in the skin. While this number remains comparatively constant, capillaries are constantly opening and closing, so that any one capillary is open for only a limited time. Thus all the adjacent cells are adequately nourished and aerated.

Normal skin responds to sudden chilling by a contraction of the capillaries in the skin. In cutis marmorata the central islands so respond, but the capillaries and venules in the livid bands remain dilated, while the arteries are closed. This causes the livid coloring. It seems to me that the capillary dilatation is possibly due to a loss of normal tonus resulting from lowered oxygen tension and absence of hormone X in a zone of poor circulation. It is conceivable that in persons subject to cutis marmorata, the nutrient arteries of the subcutis might respond with a more marked reflex spasm than in the normal person. The livid bands would correspond to areas of minimum circulation. The capillaries in these areas would not be supplied with a normal amount of hormone X, and would be under lowered oxygen tension. Dilatation would result. It is well known that persons who have cutis marmorata frequently present a chilblain circulation of the hands and feet. According to Krogh,[4] this is known to be due to spasm of the nutrient arteries with subsequent dilatation of the capillaries and venules of the skin. Both phenomena are due to similar functional disturbance of the innervation, but the anatomic distribution is slightly different.

Under varying conditions, part, or all, of this livid pattern may become more marked, may tend more to be permanent or may be a different color. This may be due to organic change in some portion of the vascular cone, or occasionally it may be associated with purely vasomotor disturbance. Such permanent change may be brought about by: syphilis, tuberculosis, arteriosclerosis, external influences, congenital anomalies of the blood vessels, other infectious diseases and toxemias.

4. Krogh: The Anatomy and Physiology of the Capillaries, New Haven, Yale University Press, 1924.

SYPHILIS

Ehrmann [5] reported a series of nine cases illustrating a condition which he termed "livedo racemosa," a new manifestation of syphilis in the blood vessels. In these cases, patients with syphilis who were subject to cutis marmorata, from two to twenty-five years after the primary infection, manifested permanent changes in part of the livid pattern in the form of a raised, bluish-red, zigzag trunk with less raised and less marked arborescent branches. These did not disappear when the body was warmed, and returned immediately after brisk rubbing. The branched figures were found on the lateral surfaces of the thighs seven times; on the buttocks, five times; on the abdomen, three times; on the chest, two times; on the deltoid region, two times, and on the lateral surfaces of the arms, calves, sacral and scapular region once each. In three instances they were associated with organic changes in the heart and arteries. In only one case in which the lesions appeared in the secondary stage did they respond to treatment. Histologically, there was proliferative change in the nutrient arteries between the cutis and subcutis in the form of obliterating endarteritis and slight periarteritis. In some instances the arterial lumen was narrowed, and in other cases it was completely occluded.

In 1912, Ehrmann [6] added seven new cases, making a total of sixteen.

Ehrmann assumed that in persons subject to cutis marmorata, secondary syphilis is usually of the large macular type and that the macules are located at the intersections of the livid network. These nodes are areas of slowed circulation, and, being loci minoris resistentiae, they are the first affected by the spirochetes. Large numbers of spirochetes are deposited in the walls and perivascular spaces about the subpapillary and deeper vessels in these areas and modify the tonus with their toxins. It is the "rests" of these spirochetes that later produce the arterial changes described in livedo racemosa. Ehrmann also expressed the opinion that the chronic toxemia produced by alcohol and tobacco probably predisposes the arteries to these attacks. As a result of the proliferating endarteritis, the systolic impulse of the deep nutrient arteries is slowed, and is not taken up by their walls, which have been rendered inelastic by hypertrophy. Hence the muscular power of the heart is barely able to drive the blood into the subpapillary network and the capillaries at systole. The moment diastole occurs the elasticity of the arteries is no longer sufficient to force the column of blood through the zone of minimum circulation, and a stasis results along the livid bands of cutis marmorata. Each branch of the treelike figure corresponds to a branch of the deep arterial net, and the trunk corresponds to the main affected arterial trunk.

5. Ehrmann: Tr. Sixth Internat. Derm. Congress, New York, 1907, p. 763.
6. Ehrmann: Arch. f. Dermat. u. Syph. **113**:261, 1912.

In the last few years a number of cases of this type have been reported in the German literature, two in the English by Simon,[7] but none in the American.

TUBERCULOSIS

The presence of a marked cutis marmorata in the subjects with tuberculosis, especially in persons with chilblain circulation of the hands and feet, has frequently been noted. Comby [8] observed in his clinic the association of a relatively permanent cutis marmorata in young children with scrofulous glands and various other manifestations of tuberculosis. He states that this type practically always disappears at puberty.

Adamson,[9] in 1916, made an interesting survey of the subject of livedo and reported six cases of cutis marmorata, all in girls from 10 to 14 years of age, in whom part of the livid pattern had become permanent, dusky red and slightly infiltrated. This permanent network was located on the calves of the legs in all cases and, in addition, on the buttocks in two cases, on the external surfaces of the arms in two and on the thighs in two. These girls all showed one or more manifestations of tuberculosis in the form of scrofulous glands, papulonecrotic tuberculids and in some instances pulmonary changes. In two cases there was associated congenital syphilis. Histologically, the intersections of the affected bands were the sites of an infiltrate of the type of erythema induratum of Bazin, and in one case the intersections broke down to form "punched-out" ulcers. Adamson considers this a manifestation of Bazin's disease, in which the site is determined by a preexisting livedo e frigore.

Fischl,[10] in 1921, reported two cases in young women, of a permanent, bluish red network of the level of the surrounding skin, located on the calves of the legs. In both of these cases there was associated tuberculosis in the form of scrofulous glands and papulonecrotic tuberculids. In both instances the roentgen ray demonstrated a latent tuberculous process in the lungs, and microscopic examination of tissue removed from the livid network on the legs revealed a periphlebitis and an endophlebitis of the vessels. Between the cutis and subcutis, the subcutaneous fat was infiltrated with epithelioid cells, giant cells and lymphocytes. Fischl concludes that livedo reticularis is erythema induratum of Bazin which is "incompletely ripe."

Waelsch [11] reported three cases of what he considered typical livedo racemosa in women who were suffering from tuberculosis of the lungs;

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7. Simon: Proc. Roy. Soc. Med. **18**:50, 1925.
8. Comby: Arch. de méd. d. enf. **15**:801, 1912.
9. Adamson: Brit. J. Dermat. **28**:281, 1916.
10. Fischl: Arch. f. Dermat. u. Syph. **136**:362, 1921.
11. Waelsch: Arch. f. Dermat. u. Syph. **132**:452, 1921.

two of them had lupus erythematosus, and the third had tuberculids. The lesions were livid arborescent bands, 4 or 5 mm. broad, which were flush with the surrounding skin and branched in a disorderly fashion. These were located on the lateral surface of the arms and on the posterior surface of the thighs and buttocks in all cases, and, in addition, in the scapular region in one case and in the sacral region in another. Waelsch made a histologic examination of a biopsy taken from the lateral surface of the forearm in his first case, and found only a dilatation of the subpapillary vessels and a perivascular round-cell infiltrate. From this he concluded that in certain instances the disorder may be due to a functional disturbance of the circulation in either the arteries or veins, but, as Polak [12] has pointed out, it is possible that his biopsy was not taken down to the fascia of the muscles, where the characteristic changes are often found.

Lehner and Kenedy [13] also failed to find anything except a slight perivascular, round cell infiltrate in two cases of permanent livid network, associated with tuberculosis. They assumed that this livedo is a toxic effect of the tubercle bacillus.

In a later communication, Lehner and Kenedy [14] reported the case of a woman, aged 40, with marked cutis marmorata and permanent livid network on the buttocks, sacrum, thighs, legs and forearms. In places this network was a replica of cutis marmorata, and in other places it formed branched and zigzag figures. There were atypical nodules of erythema induratum on the legs at the intersections of these livid bands with the histologic observations characteristic of Bazin's disease. A biopsy taken from an adjacent livid band showed only a perivascular round cell infiltrate in the papillary and reticular layers of the cutis. In this case there was a history of scrofulous glands, and the roentgen-ray examination gave evidence of latent apical tuberculosis. The authors considered that the permanent livid bands were due to hematogenous deposit of tubercle bacilli in areas of slowed circulation.

Hess and Kerl [15] reported the case of a young girl, aged 13, with typical erythema induratum of Bazin on the calves, associated with a marked retiform discoloration of the legs and lower half of the thighs. Histologic examination disclosed thrombosis of some of the deeper veins of the subcutis associated with slight round cell infiltration.

Kantor, at a meeting of the Wien Dermatoloische Gesellschaft on April 10, 1924, presented a young woman, aged 24, with typical erythema induratum on both legs, associated with well developed livedo racemosa.

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12. Polak: Arch. f. Dermat. u. Syph. **143**:193, 1923.

13. Lehner and Kenedy: Arch. f. Dermat. u. Syph. **141**:325, 1922.

14. Lehner and Kenedy: Inflammatic cutis racemosa, Arch. f. Dermat. u. Syph. **149**:387, 1925.

15. Hess and Kerl: Dermat. Ztschr. **33**: 125, 1921.

ARTERIOSCLEROSIS

In Ehrmann's [16] original series, he was unable to demonstrate syphilis in one case, that of a patient with marked peripheral arteriosclerosis. Peller,[17] one of Ehrmann's students, reported two cases clinically identical with those described as livedo racemosa by Ehrmann, in which, however, syphilis could not be demonstrated. In both of these cases the peripheral arterial system was in a state of increased tonus following cardiac hypertrophy due to high blood pressure. In one instance, he found, histologically, a vein with a thickened wall and narrowed lumen, but there was no evidence of endarteritis or perivascular cell infiltration. Peller then distinguished a new type of livedo racemosa, due to a disorder of the veins in which there is no visible organic change in the small arteries.

Urbach,[18] in 1923, reported well developed livedo racemosa on the abdomen, back, arms and legs of a patient, aged 39, suffering with aortitis, probably of syphilitic origin, with a systolic blood pressure of 180 mm. of mercury. There was an associated cutis marmorata. The capillary microscope disclosed a markedly heightened tonus in the peripheral arteries and a relaxation of the venules. Histologically, there was dilatation of the veins at the border of the cutis and subcutis with endophlebitis of the deeper veins near the fascia.

Becker [19] reported the case of a woman, aged 38, with hyperthyroidism, high blood pressure and a livedo reticularis type of hyperemia on the back of the hands and feet, on the extensor surface of the forearms and arms and on the lateral and anterior surfaces of the thighs and legs. The capillary microscope revealed atony of the capillaries in the affected bands. The results of the histologic examination were practically negative.

Grosz and Kerl [20] demonstrated livedo racemosa associated with angina pectoris and arteriosclerosis. Urbach states that in these cases there is both central and peripheral disturbance of the circulation. As a result of cardiac deficiency, the capillaries are dilated, the veins are incompletely filled, and, in addition, there is a functional disturbance of the arterial network of the skin in the form of vasoconstriction. This functional disturbance is also evidenced by hyperhidrosis, dermographism and increased deep reflexes.

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16. Ehrmann: Dermat. Wchnschr. **69**:555, 1921.
17. Peller: Dermat. Wchnschr. **73**:1157, 1921.
18. Urbach: Klin. Wchnschr. **2**:2027, 1923.
19. Becker: Generalized Telangrectasia, Arch. Dermat. and Syph. **14**:387 (Oct.) 1926.
20. Grosz and Kerl: Arch. f. Dermat. u. Syph. **137**:79, 1921.

EXTERNAL INFLUENCES

Perhaps the best known changes are the relatively permanent reticular pigmentary ones following prolonged exposure to heat, "livedo e calore." Cutis marmorata is also present, and determines the arrangement of the pigmentation. It disappears when the body is warm, but the pigmented pattern does not. Lehner and Kenedy [13] recently reported six such cases. They demonstrated histologically a marked round cell infiltrate about the veins of the cutis and the upper margin of the subcutis with an increase in pigment due to an increased number of chromatophores, as well as masses of pigment in the cutis and in the basal layers of the epidermis. This pigment did not give a reaction to iron and was most likely melanin. Lehner and Kenedy suggested that the livid bands are areas of poor circulation and consequently of lowered resistance to outside influence. Noxious agents in the circulatory system are more apt to be deposited there. They point out that instability of the autonomic and sympathetic nervous system may be a factor.

CONGENITAL ANOMALIES OF THE BLOOD VESSELS

A permanent livid mottling of the skin, which, at times assumes a retiform arrangement, and which is due to a congenital anomaly in the blood vessels, has been described by several authors, more lately by Williams and Goodman,[21] who reported two cases and gave an excellent summary of the literature. They suggest the term "livedo telangiectasia" for this group. Clinically, these cases do not resemble cutis marmorata closely.

Hess and Kerl [15] reported seven such cases, in which there was a peculiar marmorization due to the alternation of white and livid patches, present since early childhood. In some a retiform figure was simulated, but true trunks and branching figures were never found. These authors have pointed out the association of this form with other congenital defects, such as patent foramen ovale, abnormal skeletal development and disturbance of endocrine glands. The only uniform pathologic change is a vascular dilatation.

OTHER INFECTIOUS DISEASES

Urbach [18] reported a case of a young woman, aged 21, in whom there appeared a permanent livid mottling of the usual type following an attack of typhus fever. Histologically, he found evidence of an endarteritis and a slight endophlebitis in the vessels of the subcutaneous network, but no evidence of inflammatory infiltrate. He assumes that the toxins of typhus disturb the peripheral circulation and have an

21. Williams and Goodman: Livedo Reticularis, J. A. M. A. **85**:955 (Sept. 26) 1925.

elective affinity for the blood vessels. It is interesting to note in this connection that Kruse and Silter [22] have shown that the toxins of typhus and dysentery are powerful capillary dilators.

Polak [12] described a typical, well developed case of livedo racemosa of unknown duration in a woman, aged 36, suffering with chronic endocarditis. Histologically, there was marked endarteritis in the nutrient vessels of the cutis and subcutis beneath the livid bands. Polak ascribed the proliferative changes in the intima and muscularis of the small arteries to the same organisms which have produced the endocarditis. Cutis marmorata and acrocyanosis were present and were evidence of a disturbed vasomotor tonus.

TOXIC ORIGIN

Lehner and Kenedy [14] reported a case of reticular pigmentation, which followed injections of arsphenamine and disappeared in the course of several months. This resembled clinically and histologically the livedo reticularis due to external irritants, except that in this case the lesions were generalized.

REPORT OF A CASE

History.—J. T., a Polish housewife, aged 33, was first seen at the Central Free Dispensary on Dec. 5, 1925, with a marked, permanent, bluish red, reticular livedo, best developed over the arms, thighs and buttocks, but present in patchy areas over the back, in the axillary folds, in the epigastrium and in the groins. She also had two or three dime-sized ulcers on the right ankle and numerous scars on both legs, especially over the tibia (fig. 1).

For seven years she had always had two or three lesions on the legs. These appeared as subcutaneous nodules, which ulcerated in two or three weeks, persisted one or two months and healed, with scar formation, They were most frequent in the summer. The livedo-like discoloration was first noticed on the arms and thighs, four years before examination. It had gradually grown more marked. It was most noticeable in cold weather. Her hands and feet had always been cold since childhood. She had been married fourteen years, and had one healthy child, aged 10. She had had one stillbirth twelve years before she came to the dispensary. She had always felt well until the preceding year, during which she had complained of being run-down. The menstrual periods were regular, but scanty..

Physical Examination.—The patient was a well developed, well nourished woman of stocky build, who looked somewhat older than the age given. Her face was pock-marked. Her upper teeth were false, the lower teeth carious, and the tonsils were normal. She was examined in the department of general medicine at the Central Free Dispensary with special reference to a possible tuberculous infection. The results of physical examination and of the roentgen-ray examination of the chest were absolutely negative. There were no anomalies of the abdominal or pelvic organs. Her blood pressure was 92 systolic and 50 diastolic, and the hemoglobin 75 per cent. The results of urinalysis were negative. Reactions to Wassermann tests, both before and after arsphenamine treatment,

22. Kruse and Silter: Ztschr. f. Immunitatsf. u. exp. Therap. **5**:492, 1910.

were negative. The Pirquet reaction was negative. There was practically no reaction, either systemic or local, to the subcutaneous injection of Koch's old tuberculin in quantities up to 10 mg.

Examination of Skin.—There was a peculiar mottled, livedo-like discoloration of the areas described, with wider meshes and broader bands than are found in the ordinary cutis marmorata. The discoloration was most striking on the arms, particularly on the extensor surfaces. Here the bands were from 4 to 5 mm. wide and bluish red. They were at the level of the surrounding skin. The islands of normal skin were polygonal and 1.5 cm. across. There was a marked chilblain circulation of both hands and feet. If the arm was

Fig. 1.—Permanent reticular livedo, best developed on arms and thighs, but present in patchy areas over other parts of the body.

held up for several moments, the mottling largely disappeared, but it returned quickly on lowering the arm. It was most marked in all areas when the room was cool. On the extensor surfaces of the thighs and buttocks, the lesions appeared to be permanent. Here there was a bluish red reticular network formed on the pattern of an incomplete cutis marmorata. Trunks with irregular zigzag branches could be traced. The reticular markings were not raised, however, and did not feel infiltrated. They did not disappear with rubbing or when the body was warm. These bands were from 4 to 5 mm. wide. The islands of normal skin here were polygonal in some places, and in others they were irregular and varied from 2 to 4 cm. across. When the skin was

cold, the bands were more marked and were livid blue, and when warm they were brownish red. In the axillary folds, over the back, in the epigastrium and in the groins there were hand-sized patches of reticular discoloration, which was much less marked. There were several delicate white scars, varying in size from that of a pea to that of a dime, with an areola of brownish pigmentation present over the right tibial region. A few similar scars were on the calf of the leg. Over the right internal malleolus there was an irregular, oval, punched-out, shallow ulcer, measuring 2 by 4 cm., with a granulating base and a margin which was not indurated. On the dorsum of the right foot there was a similar, but smaller, ulcer. There was a moderate varicosity of the veins of the right leg with some swelling of the ankle. On the left leg the scars were much less numerous, and there were no ulcers.

Treatment and Clinical Course.—This patient was given three injections of 0.6 Gm. of neoarsphenamine at two day intervals and two injections at five day intervals, with some improvement in the ulceration. A new ulcer appeared on the upper third of the right tibia during the course of treatment, however, and a little later a similar one on the ankle. One month after the end of the treatment the original ulcers had healed, but three others had appeared. She was given three more injections of neoarsphenamine. These did not improve the condition. Quartz light therapy was started with the Alpine lamp; exposures of the anterior and posterior surfaces of the leg were made, and under this treatment the trouble entirely disappeared in one month. During this period, the patient had the few remaining lower teeth extracted.

On July 4, 1926, new painful lesions began to appear on the shins and on the dorsa of the feet, and then spread rapidly. When the patient appeared for observation on July 12, there was present on the dorsum of the right foot a dull red, infiltrated patch the size of a child's palm, made up of multiple pea-sized to bean-sized ulcers on an erythematous infiltrated base. The ulcers were shallow, from 2 to 3 mm. deep, had a serpiginous outline, and the walls appeared punched out. The floor was smooth and covered with a watery pus.

On the right external malleolus there was a bean-sized, dull red, infiltrated nodule with a pea-sized, punched-out ulcer. A biopsy was taken from this lesion. There were two similar lesions just below it on the dorsum of the right foot.

On the left external malleolus there was a dollar-sized group of similar lesions which had coalesced to form circinate and serpiginous ulcers. There were several quarter-sized purpuric hemorrhages on both shins and on the dorsum of the right foot. The lesions were both painful and tender. The patient was advised to go to the country and take sun baths, and to use soothing applications locally.

Under this regimen the ulcers healed, and the patient's general condition was markedly improved. In the early part of November, 1926, there was a recurrence of one small nodule on the left ankle, which later ulcerated in the manner described. Quartz light therapy with exposure of the involved area and of the general surface of the body was resumed. She was also given tonic medication internally. The improvement was slow; the ulcers healed, but new nodules appeared and ran the usual course. Early in January, 1927, small doses of Koch's old tuberculin were given subcutaneously at five day intervals. No new lesions appeared on the legs after this treatment. On Feb. 4, 1927, the patient came into the clinic when the outside temperature was below freezing. Her right little finger was white, cold and without sensation. The condition persisted for two hours and was followed by cyanosis. She said that a similar

condition had occurred at irregular intervals in the past two months on exposure to cold. She ascribed no importance to it.

Histology.—A biopsy was taken from an intersection of the livid bands on the right buttock. Care was taken to include a generous amount of the subcutaneous fat as far as the muscle fascia. The tissue was fixed and hardened in alcohol and stained with hematoxylin and eosin, Pappenheim's stain, Weigert's elastic tissue stain and other stains.

An examination of the sections demonstrated that the epidermis and papillary layer of the corium were unchanged. The principal changes were in the reticular layer of the cutis. There was a well marked mantle of round cells about

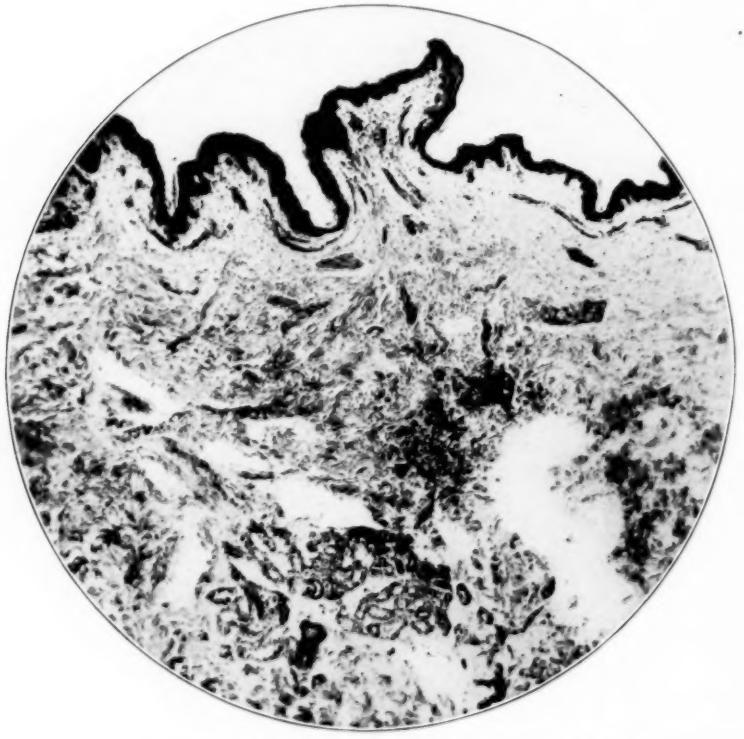

Fig. 2.—Section from livid band on the buttock, stained with hematoxylin and eosin. This shows the mantle of round cells about the vessels of the reticular layer of the cutis (*a*) as well as about the coil glands (*b*), and the proliferative changes in the artery supplying these glands (c) and thrombosis of the accompanying vein; × 25.

the vessels (fig. 2) made up mainly of lymphocytes and several epitheloid cells, a few plasma cells and an occasional mast cell. There was a certain amount of edema; the small vessels and the lymph spaces were dilated. There was a marked cellular infiltrate between the coils of the sweat glands and about the nutrient vessels of these glands. There was thrombosis of some of the veins draining these glands. The glandular epithelium was degenerated in places. The collagen fibers, the elastic fibers, sebaceous glands and hair follicles were unchanged. The most striking changes were seen at the junction of the

cutis and subcutis. Here (fig. 3) a large nutrient artery and its accompanying vein were surrounded by a dense infiltrate. This infiltrate was made up largely of lymphocytes and epitheloid cells with a few plasma cells. An organizing thrombosis of the vein and proliferative changes in the walls of the vein and artery were also present.

A biopsy taken from a recent ulcerating nodule over the right external malleolus during the latest period of activity was fixed in alcohol, embedded in paraffin and stained in the usual way. There was a lenticular infiltrate, which involved principally the corium, but extended into the subcutaneous fat. In the center there was an ulcer with destruction of the epidermis and papillary

Fig. 3—Section from livid band on the buttock, stained with hematoxylin and eosin, demonstrating a nutrient artery and its accompanying veins from the deep network at the junction of cutis and subcutis showing the perivascular infiltrate and the proliferative changes in the artery and the thrombosis of the accompanying vein; ×150.

layer of the corium. In the lower zone of the infiltrate there were marked proliferative changes in the nutrient artery. The floor of the ulcer was made up of polymorphonuclears and cellular debris in a network of fibrin and was covered by a fibrinous membrane. The walls were steep. The collagenous fibers of the corium were spread apart by edema, and, in the area directly beneath the ulcer, they were largely replaced by an infiltrate, which was densest about the larger nutrient vessels and about the coil glands and ducts. The elastic tissue was degenerated, and in the center it was completely destroyed. This

Fig. 4.—Section from the ulcerating nodule on the ankle, stained with hematoxylin and eosin, demonstrating a nutrient artery of the subcutis, showing hypertrophy of all coats and the perivascular infiltrate; × 110.

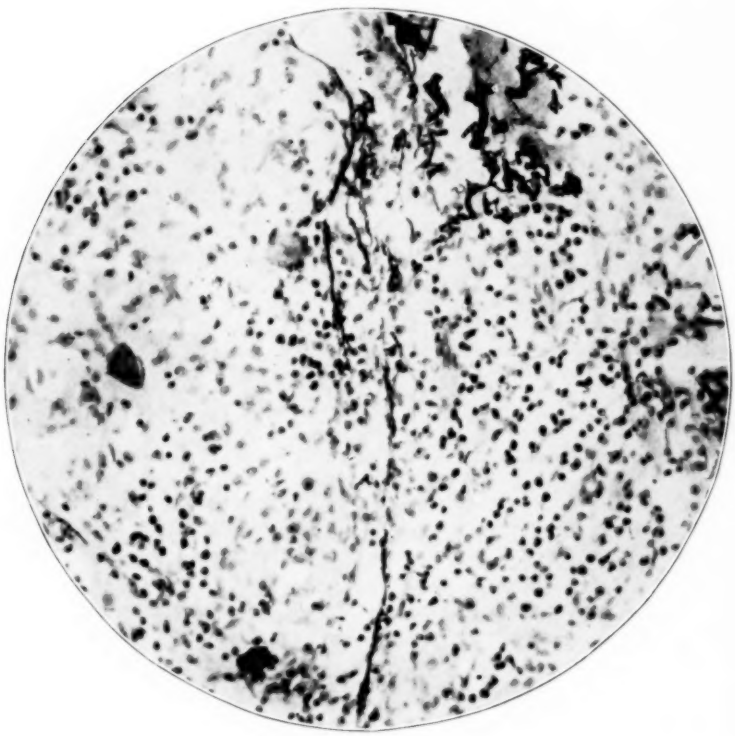

Fig. 5.—Same tissue as in fig. 3, stained with Weigert's elastic tissue stain and lithium carmine. Elastic tissue remnant of a vessel in the center of the round-cell infiltrate; ×230.

infiltrate was made up mainly of lymphocytes, plasma cells, epithelioid cells and leukocytes. The large nutrient artery of the subcutis and its branches in the corium were markedly hypertrophic. There was a proliferation of all coats (fig. 4). An elastic tissue stain demonstrated a few remaining strands of elastic tissue remaining in the center of the densest infiltrate (fig. 5) showing that a degenerated artery was probably the center of the greatest activity.

COMMENT

This case is an example of permanent livedo associated with tuberculids in a woman who had also cutis marmorata, chilblain circulation of the hands and feet and an incipient Raynaud's disease.

The ulcers, which had recurred each summer on the legs and on the backs of the feet and which had left characteristic scars, corresponded to a type of tuberculid which Lewandowsky [23] described as occurring frequently in childhood and occasionally in adult life. In this type the lesions appear as nodules in the corium, become attached to the epidermis, break down and form irregular echthymatous ulcers with sharply punched-out walls. Lewandowsky also emphasized the primary involvement of the veins and of the arteries in tuberculid. Characteristic changes were found in this case. The nutrient artery in the zone between the cutis and the hypoderm was thickened. The densest infiltrate underlying the ulcer was arranged about the elastic tissue remnant of a vessel (fig. 5). While giant cells were not found, it is well known that the infiltrate in tuberculid may be of a banal, chronic inflammatory type. The punched-out ulcers and the scars, if seen alone, might suggest syphilis. However, their symmetry, their continued recurrence in the same areas, their seasonal incidence, as well as the absolute lack of response to antisyphilitic therapy, make such a diagnosis most unlikely. In addition, the history was negative on this score with the exception of one stillbirth. The patient's Wassermann reaction, as well as those of her husband and of her child, were negative on repeated occasions. The permanent livid network in this case was not raised and not as definitely arborescent as described by Ehrmann in syphilitic livedo racemosa. Underlying the livid bands there was a thrombosis of the veins, as well as proliferative and inflammatory changes in the nutrient arteries in the subcutis with resultant inflammatory changes in the cutis.

The assignment of the present case to its proper classification is attended with difficulties. No claim is made that the list of conditions with which a permanent livedo may be associated is complete. Such an arrangement is only tentative and convenient. The association of a permanent and marked livedo with recurrent lesions on the legs, which

23. Lewandowsky: Die Tuberkulose der Haut, Berlin, Julius Springer, 1916, p. 180.

clinically and histologically resemble tuberculid, suggests that the present case may be of tuberculous origin. It corresponds clinically to the cases described by Waelsch, Lehner and Kenedy, Hess and Kerl and by Kantor. However, there was no other evidence to support such an assumption. The Pirquet test was negative. The subcutaneous injection of Koch's old tuberculin aroused no reaction. There was absolutely no evidence in the general physical examination or in the roentgenograms of the lungs to suggest the presence of a tuberculous infection. However, several competent observers believe that lesions of the nature of tuberculid and erythema induratum may be due to other causes than the tubercle bacillus. Lewandowsky would limit these terms to cases which are of proved tuberculous etiology. If this view is accepted, the present case cannot be included in the tuberculous category. There is, however, every reason to believe that the same organism or toxins which produced the ulcerating nodular lesions on the legs, produced the permanent livid network. The mechanism is the same, but the changes in the nutrient vessels are not sufficient to produce ulceration.

A disordered functional state of the vascular innervation precedes and is the predisposing cause of any anatomic changes which may later be demonstrated. In every case of cutis marmorata an abnormal vasomotor tonus is present. In the present case, chilblain circulation of the hands and feet and occasional manifestation of Raynaud's disease are also present. All these point to an abnormally marked contraction of the arteries of the skin under the stimulus of cold. In Raynaud's disease the arteries, capillaries and venules contract; in acrocyanosis the arteries alone contract, while the capillaries and venules are relaxed. In cutis marmorata the arteries and some of the capillaries are contracted while the remainder of the capillaries and venules are dilated.

Under the influence of circulating toxins or bacteria, this abnormal spasm of the deep arteries of the cutis may become relatively permanent without any histologic change. In most instances, however, definite microscopic changes result. The exact pathogenesis of the proliferative and inflammatory changes in the subcutaneous vessels and their branches in the cutis is difficult to explain. It may be the reaction of allergic tissues to showers of bacteria which are deposited in areas of slowed circulation, or it may be due to hypothetical toxins which would be deposited in these areas for the same reason. In either event the peculiar distribution of this disorder would follow the pattern of the preexisting cutis marmorata completely or in part. Cutis marmorata is common, as are syphilis and tuberculosis. Cases of permanent livedo associated with these disorders, or with any other disorder, are rare. Consequently, some other and as yet undefinable factor must be present.

SUMMARY

1. A case of permanent reticular livedo has been described, and the literature reviewed.

2. The present case was associated with lesions of the tuberculid type on the lower extremities.

3. A preexisting cutis marmorata served as a pattern and a predisposing cause of the livid network.

4. Proliferative and inflammatory changes in the deep nutrient vessels of the subcutis were present in both processes.

5. In the present case no source of infection or toxemia was discovered.

COMPARATIVE VALUE OF METHODS TO REDUCE HARMFUL EFFECTS OF NEOARSPHENAMINE BY DIFFERENT VEHICLES *

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AND

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In order to get the best and quickest results in the treatment of syphilis, the tendency now is to give arsphenamine preparations in doses as large as possible, and to shorten the intervals between courses. This tendency has often serious and sometimes fatal results, and in order to avoid angioneurotic symptoms, dermatitis and other complications, some experimenters have used as diluents other mediums than water, as blood serum, glucose, saccharose, gelatin, calcium chloride, egg albumin, gum arabic and mineral waters.

In a number of clinical experiments undertaken in our institution, this question was studied with the following results:

In guinea-pigs, Spiethoff [1] used 0.3 Gm. of neoarsphenamine to 1 Kg. of weight in solutions of blood serum and water, and the mortality was in the ratio of 1:3, respectively.

Kritchevski [2] injected arsphenamine hypodermically into rats, and the mortality was 33 per cent in preparations diluted with serum, but 93.4 per cent in preparations diluted with water.

Oliver, Yamada and Kolos [3] did not see any difference between blood serum and water. Our experiments on guinea-pigs showed that doses of from 0.4 to 0.45 Gm. of neoarsphenamine to 1 Kg. are equally toxic in solutions of blood serum and solutions of water. Doses of 0.35 Gm. could be tolerated in serum solutions, but had a lethal effect when given in water. Therefore we came to the conclusion that blood serum is in some degree able to reduce the toxicity of neoarsphenamine.

Clinically, we had under observation for from nine to twelve months, twenty-seven patients in different stages of syphilis. Altogether they received 132 injections of from 0.6 to 1.5 Gm. of neoarsphenamine.

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1. Spiethoff: München. med Wchnschr., 1914.

2. Kritchevski: Arch. f. Dermat. u. Syph., vol. 144.

3. Oliver, Jean; Yamado, So Sabro, and Kolos, Frank: Biologic Reactions of Arsphenamine. II. The Reduction of Its Toxicity by Combination with Hydrophil Colloids, Arch. Dermat. & Syph. **8**:1 (July) 1923.

Our clinical experiments showed that after the use of 0.6 Gm. of neoarsphenamine in serum, the spirochetes disappeared from a chancre within from two to seven days, and from erosions, papules on skin and mucous membranes within from two to eleven days. The chancres healed within from thirteen to eighteen days, after a total dose of from 2.25 to 3.6 Gm. of neoarsphenamine; roseolae disappeared on the twenty-first day after 3.45 Gm. of neoarsphenamine; mucous papules in the mouth, and condyloma lata disappeared in from seven to twenty days after the use of from 1.2 to 3.2 Gm. of neoarsphenamine. One gumma disappeared on the forty-fifth day after a dose of 7.5 Gm. As far as the Wassermann reaction is concerned, in nine cases out of eighteen, we saw a slight change from 4+ to 3+; in one case, from 4+ to 2+, and the others did not show any change. The temperature rose in all cases; in some to 104 F. Severe headaches appeared in thirteen cases, nausea in twelve, vomiting in five, dermatitis in one and diarrhea in three. From these experiments we came to the conclusion that the effect of injections of neoarsphenamine in serum do not differ from those in water notwithstanding the fact that the dose was much larger.

Dosage of Arsphenamine in Blood-Serum

Dose	0.6	0.75	0.9	1.2	1.35	1.5
Number of Injections	25	16	30	12	3	8

Kritchevski and Avtonomoff [4] injected arsphenamine in an acid medium into guinea-pigs, none of which survived; but fatalities did not occur among the guinea-pigs which received the same amount of neoarsphenamine in 50 per cent glucose.

Ephron and Feldman [5] got the same results in saccharose. Clinically, Weitgasser [6] found that after injections of neoarsphenamine in water, spirochetes are present after thirty-four hours, while after injections of the same doses in glucose, spirochetes disappear in twenty-four hours. Rubin found that the Wassermann reaction became negative in 80 per cent after injections of from 2.5 to 3 Gm. of neoarsphenamine in glucose. Our results were similar, and we therefore concluded that glucose is a valuable solvent for neoarsphenamine. Next we tried gelatin, 2 per cent, and found that the results were better than with blood serum, but not so good as with glucose.

Calcium chloride was used by Pulay [7] in 10 per cent solution in cases of tabes dorsalis as a diluent of neoarsphenamine. He found that the gastric crises and excruciating pains disappeared.

4. Kritchevski and Avtonomoff: Venerologia et dermatologia, no. 3, 1924.
5. Ephron and Feldman: Venerologia et dermatologia, no. 3, 1924.
6. Weitgasser: Med. Klin. **20**:113, 1924.
7. Pulay: Deutsche med. Wchnschr. **48**:223, 1922.

Kennedy [8] used the same solvent in cases in which there was an idiosyncrasy to watery solutions. We tried solutions of calcium chloride on guinea-pigs and on thirty-eight patients in different stages; the effect was favorable on some who could not stand watery solutions well, but in general there was little difference between calcium chloride and distilled water as vehicles.

Ephron and Grebin have tried different mineral waters as vehicles, but without striking results.

CONCLUSIONS

1. Neoarsphenamine is used in vehicles other than water so that it may be given in larger doses and at shorter intervals.

2. Of all vehicles used, glucose is the most promising. Gelatin, blood serum and calcium chloride have some effect in some cases.

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8. Kennedy: Deutsche med. Wchnschr. **48**:586, 1922.

EFFECT OF ELEVATION OF BODY TEMPERATURE ON THE COURSE OF EXPERIMENTAL SYPHILIS IN THE RABBIT*

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The first experimental study of the effect of elevations of body temperature on the disease phenomena of syphilis was undertaken by Weichbrodt and Jahnel.[1] The exposure of rabbits with scrotal chancres to an incubator temperature of 105.8 F. (41 C.) for thirty minutes twice daily, over several consecutive days, resulted in a lessened motility and a progressive decrease of spirochetes in serum obtained from the lesions. Simultaneously, the chancres underwent gradual involution to complete healing in from three to five weeks. Rectal temperatures of from 107.6 to 111.2 F. (42 to 44 C.), and occasionally 113.0 F. (45 C.), were produced in the animals.

Recently, Schamberg and Rule[2] have been able to prevent the development of an infection following the intratesticular inoculation of rabbits with syphilitic virus. Beginning three and four days after inoculation, the animals received from ten to eleven baths each, lasting from fifteen to twenty minutes, in water at a temperature of 113.0 F. Sublingual temperatures of from 104.4 to 110.0 F. were induced by this treatment. None of the seven animals in their combined experiments showed clinical signs of syphilis during the period of observation. Two rabbits were observed for 74 days, four for 120 days and one for 175 days. The transfer to normal rabbits of inguinal and popliteal nodes from the two rabbits observed for seventy-four days failed to transmit the infection.

In a second communication the same investigators[3] reported the curative effect of fifteen daily baths at a temperature of 113.0 F., over fifteen minute periods, on two animals with well developed scrotal chancres. Sublingual temperatures reached from 105.3 to 109.0 F. Bathing was commenced on the thirty-third day of the infection. Eight days after the initial bath, spirochetes could no longer be demonstrated

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* From the Departments of Medicine of the Johns Hopkins Medical School, Baltimore, and the Peking Union Medical College, Peking, China.

1. Weichbrodt, R., and Jahnel, F.: Deutsche med. Wchnschr. **45**:483, 1919

2. Schamberg, J. F., and Rule, A. M.: Studies of the Therapeutic Effect of Fever in Experimental Rabbit Syphilis, Arch. Dermat. & Syph. **14**:243 (Sept.) 1926.

3. Schamberg, J. F., and Rule, A. M.: Therapeutic Effect of Hot Baths in Experimental Primary Syphilis in Rabbits, J. A. M. A. **88**:1217 (April 16) 1927.

in the lesions by the dark-field method. The chancres healed completely in two weeks. Neither recurrences of the primary orchitis nor development of generalized metastatic lesions were observed up to the seventy-sixth day, at which time transplantation of the inguinal and popliteal lymph nodes was performed. Animals to which the nodes were transferred remained clinically negative to the end of eighty-three days.

THE PROBLEM

It is to be inferred from the foregoing evidence, that body temperatures within the specified limits of the experiments are capable of eradicating a recently induced syphilitic infection, both before and after the appearance of a primary lesion. If this is true, then it is of considerable significance, so far as it contributes to the establishment of a rational explanation of the beneficial effects of febrile reactions on the course of syphilitic disease. Confirmation of this assumption and a better definition of the limits within which body temperature operates to influence the infection, would open an approach to the investigation of the mode of action of febrile disease, or artificially induced febrile states, on syphilitic infections.

The purpose of the first part of this communication is to report an experiment relative to the former problem in which a study has been made of the action of high body temperatures on animals recently inoculated with virulent syphilitic virus. The second and third parts of the paper are concerned with an attempt to produce in an experimental animal (rabbit) conditions of body temperature comparable to those obtainable with safety in man, and with the effects of such temperatures on the course of the disease before and after the appearance of local reactions at the site of inoculation.

EXPERIMENTS

Water-Bath Technic.—A metal tank with an approximate capacity of 15 cubic feet, containing a steam coil, was used because of the ease with which such a volume of water could be kept at a uniform temperature for such periods as the experiment required. The animals were immersed to their necks by being suspended in a canvas sling designed with four openings through which the legs could extend freely into the water. The sling was securely fitted to the body by four tapes, two just below and two above the fore and hind legs. Two tapes at the upper margin provided for the adjustment of the animal's depth in the water. These were tied over a horizontal bar supported at both ends by the rim of the tank. To overcome the buoyancy of the water, a small weight was attached to the lower tapes. This held the animal in a steady vertical position in which there was little or no struggling.

EXPERIMENT 1.—*Inhibitory effect of high body temperature on recently inoculated animals.*

Six male rabbits of varying breeds were selected for the experiment. All were inoculated in the right testis with equal portions of a testicular emulsion containing *Spirochaeta pallida*. The Nichols strain was used in all these experiments.

The animals were divided into two groups. Four days after inoculation, the first group (group *A*), composed of three animals, received the first of ten daily baths. Each bath was of fifteen minutes' duration in water at a temperature of 113.0 F. In my experience, exposure to this temperature for longer periods cannot be carried out with safety to the rabbit. The second or control group (group *B*), composed of three animals, was not bathed.

Rectal temperatures were taken on all animals before and immediately after the baths.

The blood Wassermann reaction was performed on five of the animals before inoculation, and on all at weekly intervals thereafter. Two of the initial reactions were negative. In one (rabbit 3) there was a partial fixation of complement (+). The technic used was that described by Kemp, Chesney and Poole.[4]

With the exception of one animal (rabbit 1) which died thirty-four days after inoculation, those in group *A* were kept under observation for a period of 104 days. At the expiration of this time the right testis and both popliteal lymph nodes of each test animal were excised under ether anesthesia and inoculated into two normal animals. Each testis was emulsified separately in physiologic sodium chloride solution, and equal parts of the emulsion were inoculated into the right testis of each of the two transfer rabbits. Likewise, both popliteal nodes of each animal were emulsified and inoculated into the left testis of each of the transfer animals. The entire emulsion of the nodes was inoculated in each case. Animals to which the tissue was transferred were observed for ninety days before being discarded as normal.

Results: The rectal temperatures of each animal before and after bathing are shown in table 1. The temperatures recorded daily for the controls are comparable to those of the test group before bathing. The normal range of body temperature among the animals of both groups varied from 99.7 to 103.4 F. Body temperatures subsequent to the baths reached from 106.2 to 110.6 F. Untoward reactions were not observed.

Rabbit 1 died of pneumonia on the thirty-fourth day after inoculation, at which time eighteen days had elapsed since the last bath. There had not been any clinical signs of infection, and the blood Wassermann reaction had been negative twice, the last time seven days prior to death. In the two remaining test animals, numbers 2 and 3, no clinical manifestations of syphilis, either local or generalized, developed during the 104 days of observation. Up to this time animal 3 had always shown a negative reaction, but on this day the reaction was doubtful (+ +).

The controls all had a typical syphilitic orchitis on the eighteenth and twentieth days, and two of them presented metastatic lesions of the uninoculated testis on the forty-sixth and fifty-seventh days of the infection, respectively. Each had a positive blood Wassermann reaction.

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4. Kemp, J. E.; Chesney, A. M., and Poole, A. K.: Bull. Johns Hopkins Hosp. **39**:132, 1926.

TABLE 1.—*Effect of Hot Baths on the Body Temperature and Clinical Course of Syphilitic Infection in the Rabbit During the Incubation Period*

Rabbit	Rectal Temperatures Before and After Bathing Days After Inoculation										Results			
	4	5	6	8	9	11	12	13	15	16	Clinical	Wassermann Reaction	Testis Transfer	Node Transfer
Group A Test Animals														
1.....	**101.2**	**102.8**	**102.1**	**99.7**	**101.2**	**101.2**	**101.0**	**103.0**	**101.7**	**100.0**	Died on 34th day	Always negative	Not done	Not done
	109.6	109.0	109.2	108.8	109.4	108.4	108.4	108.9	108.4	109.0	0			
2.....	**101.6**	**103.0**	**101.6**	**100.1**	**102.1**	**102.0**	**101.5**	**100.4**	**101.8**	**101.8**	.....	Always negative	0	0
	107.9	108.6	107.6	106.9	107.6	110.2	106.2	106.8	108.2	108.1	0			
3.....	**102.2**	**102.8**	**102.9**	**100.9**	**102.4**	**101.6**	**102.0**	**101.7**	**101.6**	**101.4**	.....	Doubtful (88)	+	+
	107.8	108.4	108.8	109.2	110.6	106.6	109.0	108.5	108.6	108.8	0			
Group B Controls														
4.....	**101.8**	**101.4**	**101.6**	**100.7**	**101.6**	**100.6**	**101.8**	**102.0**	**101.2**	**102.3**	Orchitis (18) Metastatic orchitis (46)	Positive (27)	Not done	Not done
5.....	**102.4**	**103.4**	**104.2**	**100.6**	**102.6**	**101.8**	**101.2**	**101.5**	**102.3**	**101.4**	Orchitis (20) Metastatic orchitis (57)	Positive (39)	Not done	Not done
6.....	**103.0**	**102.2**	**102.2**	**100.4**	**102.5**	**101.6**	**102.5**	**102.4**	**102.0**	**102.4**	..... Orchitis (20)	Positive (27)	Not done	Not done

* The water-bath temperature was 113 F.; the duration of each bath, fifteen minutes. The body temperatures before bathing are shown in bold face. The figures in parentheses indicate the number of days after inoculation.

The two normal animals inoculated with material from the right testis and popliteal nodes of rabbit 2 remained clinically negative for fifty-seven and ninety days, respectively. As judged by such a criterion of cure, this rabbit, at the time the tissues were transferred, was free of spirochetes.

Of the two normal animals inoculated with lymph nodes and testis from rabbit 3, one developed a syphilitic orchitis of the left testis (transfer of tissue from lymph node) forty-nine days after inoculation, and the other a syphilitic inflammation of both testes (transfer of tissue from testis and lymph node) thirty days following inoculation. Consequently, it is concluded that a local infection had taken place in this animal, without clinical phenomena, from which a dissemination of spirochetes had occurred, without detectable generalized lesions.

Although a small number of animals was used in the experiment, it is obvious that baths at 113.0 F. for ten days, followed by body temperatures of from 106.2 to 110.6 F. (rectal) exerted a definite, although variable inhibitory influence on the course of syphilis in the rabbit when carried out shortly after inoculation, and before the appearance of clinical lesions. Not one of the three animals subjected to the bath regimen developed clinical manifestations of infection, while three untreated animals developed the disease within the usual period. In one rabbit there were no spirochetes, or only a number insufficient to transmit the infection to normal animals; and in another, the infection had been so effectively suppressed that the disease remained latent and clinically unrecognizable. The doubtful blood Wassermann reaction of the latter animal may be of significance when considered from the point of view of the positive testis and node transfer sixteen days later.

These results are not in complete accord with those of Schamberg and Rule. However, it is impossible to make strictly parallel comparisons, because of the difference in methods of measuring body temperature.

Regulation of Body Temperature.—Preliminary tests demonstrated the practicability of regulating the maximal range of body temperature of the rabbit with a fair degree of accuracy. Animals immersed to the neck in water at a temperature of 107.6 F. reacted with temperatures ranging from 103.5 to 106.7 F., in approximately five minutes. An additional fifteen minutes in the bath did not effect a significant variation in the height of the body temperature. The limit of increase was independent generally of the normal body temperature, which for the rabbit may vary from two to three degrees from day to day. In view of this fact, the normal temperature has been disregarded as an unimportant factor when its elevation is restricted to ranges of relatively fixed limits. The temperature data in tables 3 and 4 confirm these statements.

Temperature Variations After Bathing.—Immediately after the animal is removed from the bath there is a rapid fall of body temperature. At the expiration of from ten to twenty minutes it reaches the

normal for the animal as recorded before the bath. It then gradually continues to decrease, reaching a subnormal level where it remains for several hours. Repeated daily elevations do not tend to influence the normal average range. Table 2 is illustrative of the typical case.

EXPERIMENT 2.—*Effect of body temperatures not exceeding 106.5 F. during the incubation period.*

For the purpose of this experiment nine male rabbits of various breeds were selected. Each was inoculated in the right testis with an equal part of an emulsion of a syphilitic testis containing *Spirochaeta pallida.* The animals were then divided into two groups. The first or test group (group *A*), containing six animals, received a series of twenty-minute baths at a temperature of 107.6 F. Bathing was commenced on the third day following inoculation and concluded on the fourteenth day. During this time each animal received ten baths at not less than twenty-four hour, nor more than forty-eight hour, intervals. The three animals in the second group (group *B*) were retained as controls and received no baths.

The blood Wassermann reactions of the nine animals were all negative before the development of a primary orchitis.

TABLE 2.—*Behavior of Body Temperature of the Rabbit After Bathing*

		Minutes After Bath						Hours After Bath				
Day	Before Bath	0	5	10	15	20	30	1	2	3	4	5
1	102.8	105.4	.....	103.0	.....	101.7	101.2	98.7	100.0	.....	.....	.....
2	102.8	106.3	103.9	103.4	102.1	.....	.....	101.2	102.4	101.8	.....	.....
3	101.8	105.7	.....	.....	.....	.....	.....	.....	100.6	100.8	101.0	100.8

Results: The temperature elevations for each animal are recorded in table 3. The maximal range for the group was from 104.3 to 106.5 F.

Each of the six test animals manifested a typical syphilitic orchitis on the twenty-fourth to thirty-first days after inoculation. Dark-field examination of material aspirated from the involved testis was positive for *Spirochaeta pallida.* Subsequently, four of these animals developed a metastatic orchitis of the uninoculated testis, two showed cutaneous lesions and one had a periostitis. The three controls came down with primary lesions from fifteen to twenty-one days after they had been inoculated. Of these, all later developed metastatic lesions of the uninoculated testis, two of the skin, one of the periosteum and bone and two of the eye.

Other than the short prolongation of incubation time in the treated animals over that of the controls, there was no significant difference between the clinical course of the disease in the two groups.

The blood Wassermann reaction of animal 11 remained persistently negative. However, dark-field examination of the material from the chancre was positive for *Spirochaeta pallida.* Otherwise, all animals, irrespective of treatment, developed positive reactions.

This experiment demonstrates clearly that ten baths at a temperature of 107.6 F., with subsequent body temperature of from 104.3 to 106.5 F. in six animals, did not exert any significant influence on the course of a syphilitic infection when such temperatures prevailed during the early

TABLE 3.—*Effect of Hot Baths on the Body Temperature and Clinical Course of Syphilitic Infection in the Rabbit During the Incubation Period* *

Rabbit	Rectal Temperatures Before and After Bathing — Days After Inoculation										Course of the Disease After Bathing					
	3	4	5	7	8	9	10	11	12	14	Inoculated Testis	Wassermann Reaction	Metastatic Lesions			
													Testis	Skin	Bone	Eye
Group A Test Animals																
7	**102.1**	**101.6**	**102.0**	**102.2**	**102.6**	**102.2**	**102.6**	**103.1**	**101.5**	**101.8**						
	105.2	106.0	104.8	105.2	105.2	105.5	105.0	105.8	105.2	104.4	Orchitis (24)	Positive (28)	0	0	0	0
8	**101.8**	**101.8**	**102.3**	**102.1**	**102.0**	**102.2**	**101.8**	**101.8**	**101.6**	**102.1**						
	105.6	105.1	104.6	104.7	104.7	104.9	104.6	104.4	104.8	104.3	Orchitis (21)	Positive (46)	+ (60)	0	0	0
9	**101.8**	**101.1**	**102.6**	**101.2**	**102.3**	**102.0**	**101.9**	**101.2**	**101.8**	**101.6**						
	105.0	104.6	105.3	105.2	106.3	105.3	105.0	105.2	105.7	104.7	Orchitis (31)	Positive (46)	0	0	0	0
10	**102.1**	**102.0**	**102.1**	**101.5**	**100.8**	**101.6**	**101.6**	**102.6**	**101.3**	**101.8**						
	105.5	105.2	105.0	105.4	105.8	105.9	105.2	105.6	106.1	104.9	Orchitis (24)	Positive (46)	+ (51)	+ (60)	+ (60)	0
11	**101.9**	**102.3**	**102.2**	**102.6**	**102.2**	**101.9**	**100.6**	**102.2**	**101.6**	**102.3**						
	106.0	105.7	105.2	104.7	105.6	105.5	104.6	105.3	105.5	105.3	Orchitis (24)	Always negative	+ (51)	+ (60)	0	0
12	**102.1**	**102.6**	**102.0**	**102.8**	**102.8**	**102.4**	**102.5**	**102.2**	**101.8**	**101.8**						
	104.8	105.7	106.4	105.4	106.3	106.5	105.0	105.5	106.0	105.7	Orchitis (24)	Positive (46)	+ (46)	0	0	0
Group B Controls																
13	**101.6**	**101.4**	**102.0**	**100.2**	**100.9**	**101.4**	**101.6**	**102.0**	**101.3**	**101.8**	Orchitis (21)	Positive (28)	+ (60)	+ (67)	0	+ (93)
14	**102.0**	**101.3**	**101.5**	**101.3**	**101.0**	**101.4**	**100.9**	**101.0**	**101.0**	**101.2**	Orchitis (15)	Positive (28)	+ (51)	0	0	0
15	**101.2**	**100.9**	**101.6**	**99.5**	**100.6**	**100.8**	**99.5**	**100.9**	**101.0**	**100.0**	Orchitis (15)	Positive (28)	+ (42)	+ (60)	+ (60)	+ (74)

* The water-bath temperature was 107.6 F.; the duration of each bath, twenty minutes. The body temperatures before bathing are shown in bold face. The figures in parentheses indicate the number of days after inoculation.

incubation period. This is in direct contrast to the observations in the first experiment in which baths at a higher temperature, over shorter periods, followed by maximal temperatures of from 106.2 to 110.6 F., effectively inhibited the development of demonstrable lesions, and in one animal apparently completely suppressed the infection.

EXPERIMENT 3.—*Effect of body temperatures not exceeding 106.7 F. on a clinically established infection.*

Eight male rabbits of several breeds were inoculated in the right testis with equal quantities of a testicular emulsion containing *Spirochaeta pallida*. Thirty days later, when all had developed a syphilitic orchitis, they were divided into two groups. Group *A*, consisting of five animals, received ten baths at not less than twenty-four hour, nor more than forty-eight hour, intervals, in water heated to a temperature of 107.6 F. The duration of each bath was twenty minutes. The last bath was given forty days after inoculation. Group *B*, composed of three animals, served as controls. These rabbits were not bathed.

The clinical evolution of the testicular lesions was carefully followed at frequent intervals and graphically recorded. No attempt was made to follow the behavior of the spirochetes in the lesions, because of the possibility that trauma incidental to such examination might influence the clinical course. Six of the animals were observed for 130 and 131 days, at which time they were killed, and autopsy was performed.

Results: Ten baths at a temperature of 107.6 F., followed by body temperatures from 103.5 to 106.7 F. over the specified intervals, failed to modify in any manner the usual clinical course of the disease in the five animals subjected to the test. The reaction of both groups of animals to infection was one of remarkable uniformity. This is brought out in table 4.

No appreciable inhibition of growth of the primary lesions was noted during the progress of the baths. The first scrotal chancre appeared on test animal 16 after it had received eight baths.

Sixty days after inoculation (twenty days after the last bath), positive signs of regression in size of the scrotal lesions were seen in only one of the five treated animals (rabbit 18), while on the same day, two of the three controls exhibited regressing chancres. At autopsy on the one hundred and thirtieth day of the infection, small residual nodules were found in the right testis of rabbits 16 and 20 of the treated group, and similar lesions were seen in rabbits 21 and 23 of the controls.

These results coincide with those of the second experiment in which identical methods of treatment were employed. In general, repeated bathing at temperatures of 107.6 F., resulting in elevations of body temperature from 103.5 to 106.7 F., failed to have any effect on the clinical course of syphilis in the rabbit, if an exception is made of the short prolongation of the incubation period observed in the second experiment; while under similar conditions of time, bathing in 113.0 F. followed by body temperatures from 106.2 to 110.6 F., in a small series of animals, definitely inhibited the clinical progress of the disease, and in one case appeared to have eradicated the infection.

TABLE 4.—*Effect of Hot Baths on the Body Temperature and Clinical Course of Syphilitic Infection in the Rabbit Following the Appearance of the Primary Lesion* *

Rabbit	Rectal Temperatures Before and After Bathing, Days After Inoculation										Course of the Disease After Bathing				
	30	31	32	33	35	36	37	38	39	40	Original Lesion 60 Days After Inoculation	Metastatic Lesions			
												Testis	Skin	Bone	Eye
Group A Test Animals															
16	**102.0**	**103.3**	**101.6**	**102.9**	**102.0**	**101.8**	**102.6**	**102.6**	**102.7**	**102.0**					
	106.3	106.2	106.0	105.7	105.2	106.0	105.8	105.4	106.5	105.7	Increasing	+ (74)	0	0	0
17	**101.4**	**102.0**	**101.8**	**102.3**	**102.0**	**102.0**	**101.4**	**101.9**	**103.9**	**102.0**					
	105.6	105.2	105.7	106.0	105.3	106.0	105.3	105.7	106.7	105.1	Increasing	+ (67)	0	0	0
18	**101.3**	**102.0**	**102.3**	**102.0**	**102.1**	**103.0**	**102.0**	**103.2**	**102.6**	**100.6**					
	105.4	105.2	104.6	105.0	106.0	105.1	105.0	105.7	105.2	103.5	Decreasing	+ (60)	+ (82)	+ (67)	+ (82)
19	**101.8**	**102.7**	**102.2**	**102.8**	**102.2**	**102.0**	**101.8**	**101.3**	**101.8**	**101.8**					
	105.1	104.5	105.0	105.3	104.9	104.6	105.0	104.3	104.0	104.4	Increasing	0	0	0	+ (74)
20	**101.8**	**102.0**	**101.7**	**102.2**	**102.0**	**101.4**	**101.8**	**101.7**	**101.2**	**102.0**					
	105.1	104.0	106.0	105.4	105.5	104.9	104.8	104.8	105.0	104.6	Increasing	+ (46)	0	0	+ (114)
Group B Controls															
21	**101.5**	**102.2**	**101.8**	**102.4**	**102.2**	**101.4**	**100.0**	**102.4**	**101.6**	**101.8**	Increasing	+ (60)	+ (67)	0	+ (93)
22	**101.1**	**101.3**	**101.4**	**101.2**	**101.3**	**100.6**	**101.8**	**101.0**	**101.0**	**101.4**	Decreasing	+ (51)	0	0	0
23	**101.0**	**100.9**	**100.8**	**101.8**	**101.8**	**101.0**	**101.8**	**101.8**	**101.4**	**101.9**	Decreasing	+ (42)	+ (60)	+ (60)	+ (74)

* The water-bath temperature was 107.6 F.; the duration of each bath, twenty minutes. The body temperatures before bathing are shown in bold face. The figures in parentheses indicate the number of days after inoculation.

In considering the explanation of the difference in behavior of the animals in the two categories, at least two possibilities must be taken into account. It may be that the greater efficacy of the baths at a higher temperature is referable solely to the direct thermal effect of the higher body temperature of the rabbit on the spirochetes. If this is true, then it would appear that in the rabbit, at any rate, a range of body temperature from 103.5 to 106.7 F., attained ten days in succession and maintained for fifteen minutes each day, does not represent the in vivo thermal death point of *Spirochaeta pallida* in that animal, whereas body temperatures from 106.2 to 110.6 F. are closer to that point.

One must also consider the possibility that the spirocheticidal effect of baths at higher temperature is due not to thermal effect alone, but also to the activity of some unknown agent or *X* factor which is released when the rabbit's body temperature attains a level of 110.6 F., but is not released at a maximum of 106.7 F. This is, of course, entirely a matter of speculation at present, but it is worth while mentioning, for if body temperatures from 103.5 to 106.7 F. in the rabbit are ineffective in influencing the course of syphilis in that animal but prove to be efficacious in man, such a difference in the effect in the two species would have to be explained on the basis of something more than direct thermal action alone.

Whether the lower temperatures prevailing over longer periods would give the same results as those observed after the higher body temperatures in the first experiment must be a subject of further investigation.

SUMMARY

Body temperatures ranging from 106.2 to 110.6 F. (rectal), induced in rabbits by bathing in water at 113.0 F. for fifteen minutes at intervals of not less than twenty-four or more than forty-eight hours resulted in definite inhibition of the clinical progress of the disease in three animals inoculated with virulent syphilitic virus four days before the institution of the first of ten baths; and in complete suppression of the infection in one of these animals, as judged by the transfer of testis and lymph node. Three control animals, inoculated on the same day with identical material, but not subjected to the bathing process, developed local syphilitic lesions at the site of inoculation within the usual period, and two of them later showed metastatic lesions of the uninoculated testis.

In the attempt to produce elevations of body temperature within the range of those obtainable with safety in man, it was found that bathing rabbits in water at 107.6 F. for twenty minutes would, on repeated trials, produce elevations of temperature within the limits of from 103.5 to 106.7 F.

Temperatures of this range, subsequent to ten baths given at the same intervals as those in the first experiment, were without significant influence on the clinical course of a syphilitic infection when such temperatures prevailed during the early incubation period in six animals, or after the disease had manifested itself as a primary orchitis in five animals. Other than a short prolongation of the incubation period in the first six rabbits, there was no demonstrable difference between the clinical course of the disease as observed in the test animals and that in the untreated controls.

BISMUTH POISONING IN THE TREATMENT OF SYPHILIS

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While the comparatively recent addition of bismuth to the physician's armamentarium in the management of certain cases of syphilis has marked a step forward, it has also added another element of danger, namely, the possibility of bismuth intoxication. We have been aware for many years of the toxic and even fatal results that have occurred when bismuth salts were given by mouth or by rectum, applied to granulating surfaces, injected into sinuses or used internally for roentgenographic purposes, but little attention seems to have been paid to the effects of the drug when given by the intragluteal route.

When bismuth is introduced into the body, it is eliminated in the urine, feces, bile, sweat and saliva. If elimination is hindered, especially by way of the kidneys and liver, if large or frequently repeated doses are given, or if there is rapid absorption of even a small quantity of the drug, some of the clinical symptoms of intoxication may occur. Chief of these are stomatitis and gingivitis, less commonly gastroenteritis, circulatory disturbances, fever, nephritis and changes in the central nervous system.[1]

The oral changes are divided by Lewin [2] into four stages: (1) bismutosis buccalis, (2) stomatitis simplex, (3) stomatitis ulcerosa and (4) stomatitis gangrenosa. These buccal phenomena usually occur in a definite order. According to Boelsen,[3] there is first a slight pigmentation, on which secondary inflammatory phenomena develop; especially characteristic of these phenomena is the suddenness with which they appear. Pigmentation first occurs as a gum line, which usually begins along the lower incisors, where tartar and other organic debris are frequently deposited. The pigmentation in this region forms the basis of a gingivitis. A small, light blue spot is first seen, which, as it develops about the margin of the gum, appears as a slate colored band, frequently similar to the lead line. Circumscribed pigmented areas then appear on the lips, gums, palate, tongue and sublingual regions, and on or about inflamed areas in the mucosa. The pigmented areas usually

1. Shivers, C. H.: Clinical Value of Bismuth In Treatment of Syphilis; Report of Some Unusual Reactions Following Its Administration, Arch. Dermat. & Syph. **10**:414, (Oct.) 1924.

2. Lewin, quoted by Boelsen, Ulrich: Ueber Mundschleimhauterkrankungen bei Bismogenol Behandlung, Med. Klinik. **19**:757 and 793, 1923.

3. Boelsen, Ulrich (footnote 2).

range from blue-black to steel gray, are more or less sharply defined, have an irregular oval shape, and vary in size from a millimeter to several centimeters or even larger. They disappear slowly and may be seen weeks after cessation of all treatment. Inflammatory changes in the form of a gingivitis develop, and in neglected mouths, ulcerative and gangrenous patches may be seen. Strempel and Arnuzzi [4] have produced these pathologic changes in rabbits following intramuscular injections of bismuth.

In discussing the etiology, three factors are to be considered: (1) the size and interval of the dose, (2) the condition of the mouth and teeth and (3) the care of the mouth. The importance of the frequency of administration is evidenced by the study of two series of cases reported by Milian and Perin.[5] The first series consisted of thirty patients, each of whom received 2 cc. of a preparation containing 64 per cent of bismuth every day. Sixteen patients, or 53 per cent, developed a gum line; three, or 11 per cent, gingivitis and eleven, or 36 per cent, ulcerative stomatitis. The second series consisted of twenty patients, who received the same dose, but at three-day intervals. One patient, or 5 per cent, did not develop any untoward results; fourteen, or 70 per cent, developed a gum line; three, or 15 per cent, developed gingivitis and two, or 10 per cent, ulcerative stomatitis. Clement, Simon and Bralez,[6] who give 0.2 Gm. of bismuth twice weekly, report that 27 per cent of their patients developed a bismuth line and 10 per cent definite stomatitis. The care of the mouth and teeth and the condition of the buccal cavity is of further significance. This is readily borne out by comparing clinic cases with cases in private practice. Milian and Perin [7] state that inflammatory phenomena did not occur in fifteen private patients. Clement, Simon and Bralez [6] report that in their clinic cases 27 per cent of the patients developed a definite gum line and 10 per cent a stomatitis, as compared with the occurrence of a gum line in 8 per cent and a stomatitis in 4 per cent in their private cases. This experience is similar to that of Heckelman.[8] Shivers,[1] however, reports that in sixty cases of tertiary syphilis the patients received bismuth potassium tartrate with butyn, 0.1 Gm. at a dose, never oftener than twice weekly, and not one developed stomatitis.

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4. Strempel, R., and Arnuzzi, G.: Zur Histopathologie der Wismutstomatitis mit experimentellen Beiträgen, Dermat. Ztschr. **42**:1, 1924.

5. Milian and Périn: La stomatite bismuthique, Rev. de stomatol. **24**:460, 1922.

6. Clement, Simon and Bralez, quoted by Boelsen (footnote 2).

7. Milian and Périn: La stomatite bismuthique, Rev. internat. de méd. et de chir. **32**:15, 1922.

8. Heckleman, J.: Observations on the Pharmacology and Toxicology of Bismuth, Dermat. Wchnschr. **80**:546, 1925.

Comparatively few reports of severe bismuth stomatitis have appeared in the literature. Hudelo, Simon and Richon [9] report a severe case occurring in a woman, aged 22, who received eight injections of bismuth over a period of eight weeks (from 0.2 Gm. to 0.4 Gm. a dose). Immediately following the last injection the symptoms appeared. Summe [10] records a similar case in a woman, aged 20, who received eleven intramuscular injections, a total of 2.8 Gm. of bismuth. Two days after the last injection a severe stomatitis developed. Strempel and Arnuzzi [4] report two cases, as does Klare.[11] In the case reported by Chatellier and Hude,[12] stomatitis occurred after the third injection. In Vilanova's [13] case, the small total of 0.237 Gm. of metallic bismuth in eighteen days induced phenomena of severe stomatitis, in addition to grave gastro-intestinal symptoms and tubular nephritis.

An unusually severe case [14] of bismuth stomatitis came under my observation recently:

REPORT OF A CASE

A woman, aged 43, suffering from an old cerebrospinal syphilis, who had had numerous intensive courses of arsphenamine, mercury and iodides, was started on bismuth therapy (potassium bismuth tartrate). She was given 0.1 Gm. intramuscularly on May 27, 1925. She did not return again until July 9, and from that date to July 30, she received weekly injections of 0.1 Gm. From July 30 to October 22, she received weekly injections of 0.2 Gm. The urine was carefully examined before each injection, and was always negative. On October 15 (after the fourteenth injection, and after a total of 2.4 Gm. had been administered), the patient complained of diarrhea. She was next seen on October 27, when her mouth was swollen and painful, and by October 29, she could hardly eat. On this date she was admitted to the Cook County Hospital (service of Drs. Frederick Tice and A. A. Goldsmith). Examination of the mouth was made at this time. The lining of both cheeks exhibited numerous gray to grayish-black ulcerated and gangrenous areas, varying in size from a few millimeters to 3 or 4 cm., with irregular margins and sloughing base, emitting a foul-smelling, thin, purulent discharge. The severest lesions were located in the regions opposite the molar teeth; the few remaining teeth were decayed and loose. The gums exhibited a definite gingivitis and an irregular

9. Hudelo: Simon, C., and Richon: Stomatite bismuthique avec erythrodermie cutanee, Bull. Soc. franç. de dermat. et syph. **30**:72, 1923.

10. Summe, George: Bemerkungen zur Wismutbehandlung der Syphilis. Ueber die Bedeutung des Wismutsaums des Zahnfleisches, Med. Klinik. **19**: 1083 (Aug. 5) 1923.

11. Klare, A.: Ueber Wismutablagerungen in der Schleimhaut der Zunge und Wange nach Bismogenolbehandlung, München. med. Wchnschr. **71**:1722 (Dec.) 1924.

12. Chatellier, H. P., and Hude: Un cas grave de stomatite bismuthique diffuse, Ann. d. mal. de l'oreille, du larynx. **43**:596, 1924.

13. Vilanova, X.: Acute Bismuth Poisoning, Ann. d mal. vén. **20**:25, 1925.

14. I am indebted to Dr. Arthur W. Stillians, professor of dermatology, Northwestern University Medical School, for many of the details of this case.

interrupted gray-black line at their margins. There were a few small pigmented areas on the mucous membrane of the lower lip. The breath was markedly offensive. The tongue and pharynx were not involved, but the submaxillary and postcervical lymph glands were enlarged and tender.

The patient was immediately given 1 Gm. of sodium thiosulphate intravenously, and this treatment was repeated every other day until six injections had been given. At the same time a mouth wash of potassium chlorate was used. Fluids were given in large quantities, and elimination favored. Small doses of codeine and acephenetidin controlled the pain. Within four days the subjective symptoms were much improved. By the third week, the lesions in the mouth had healed, but the pigmentation was still present at the end of the fifth week.

Several fatalities have been reported following intramuscular administration of the drug. One fatal case has been reported by Smechula and a second by Criado;[15] a third death is recorded by Munck.[16] His patient had received a total of 5.13 Gm. of bismuth when symptoms suggesting bismuth poisoning developed. Necropsy revealed severe stomatitis, cirrhosis of the liver, nephrosis and colitis. Chenoy's [17] fatality occurred in a Hindu two hours after one injection of bismuth. The drug was apparently injected inadvertently into a gluteal vein.

SUMMARY

A case of severe bismuth stomatitis is reported and attention called to the fact that the use of bismuth, while of great value in the management of certain cases of syphilis, is attended with some danger. Toxic phenomena induced by this drug may be evidenced by a gum line, gingivitis, stomatitis of varying severity, gastro-intestinal and renal changes and involvement of the central nervous system. In some instances, the administration of comparatively small doses of bismuth may result in death.

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15. Criado, quoted by Heckelman (footnote 8).

16. Munck, J.: Bismuth Poisoning with Fatal Termination During Treatment of Syphilis, Ugesk. f. Laeger **88**:637, 1926.

17. Chenoy, C. F.: Death Due to Bismuth Injection, Indian M. Gaz. **61**:234 (May) 1926.

Editorial

THE ADVERTISING AGENT'S QUESTIONNAIRES

Apparently, the advertising agencies are getting the questionnaire habit. We dermatologists at least, have become familiar with the questionnaires they are sending us, which blandly ask for all sorts of information that pertains, in one way or another, to the care of the skin and to the use of soaps and cosmetics. It is probably not uncommon for us to give serious and laborious efforts to the answers to these questionnaires. We have the feeling that we want to help along anything that will properly educate the public in medical matters, and, perhaps, are not unresponsive to the implication of our importance as suggested by the fact that we are thus applied to for information. Incidentally, no compliment is implied when one receives questionnaires; they are sent to everybody.

It is desirable, of course, that advertising agents should be intelligently informed in regard to the things they advertise that are used on the skin. There is certainly room for their education. In fact, judging from the tone of most cosmetic advertisements, if they are not written by persons who intellectually are children, they at least are addressed to people who are. A moment's consideration, however, shows that these questionnaires are simply bald attempts at impositions on us. Advertising agencies are commercial concerns; they are not on the pauper list. If they want the benefit of our knowledge they ought to come around like self-respecting patients and pay for it. It is not a case of worthy charity; it is not even a case of educating the public; it is purely a case of the advertising agencies getting something for nothing. They apparently hope that by circularizing a large number of men they can get valuable information out of some of the letters at the expense of a little correspondence. Of course, if they really wanted authoritative information they would go to some responsible dermatologist of their acquaintance, get his advice and pay for it, as those who are not paupers usually do. There is no reason why the dermatologist should be working for the advertising agencies without remuneration, and it is to be hoped that he is getting in the habit of throwing the questionnaires in the waste basket, where they belong.

W. A. P.

News and Comment

ILLINOIS

State Department Adopts the Kahn Test.—After June 1, 1927, the laboratory of the Illinois Department of Public Health will use the Kahn test as the official serologic test for syphilis in place of the Wassermann test. The Wassermann test will be made on the special request of physicians when conditions seem to warrant additional information. This action was taken on recommendation of the advisory board after a comprehensive study of thousands of tests.

NEW YORK CITY

Dermatologic Clinic Reorganized.—The New York Post-Graduate Medical School announces that its dermatologic clinic has been reorganized and equipped to teach all branches of dermatology and syphilology; it occupies eighteen rooms, and has facilities for the recent advances in diagnosis and treatment. Dr. George M. MacKee is director of the department, and there is a staff of forty members, twenty-one clinical assistants and ten technicians. Many members will be constantly engaged in research work.

Appointments and Promotions at New York University.—An announcement was made, May 26, of appointments and promotions at New York University. Dr. Isaac Levin was appointed clinical professor of cancer research in the medical school; Dr. Walter J. Highman, clinical professor of dermatology and syphilology, and Dr. Clement J. Halperin, clinical professor of dermatology and syphilology.

CALIFORNIA

The following promotions on the faculty of the University of California Medical School have been announced: Hiram E. Miller, associate clinical professor of dermatology; Laurence Taussig, assistant clinical professor of dermatology.

ITALY

Under the chairmanship of Prof. G. Bosellini, director of the Clinica dermosifilopatica at Rome, the Societa italiana di dermatologie e sifilografia held its twenty-third congress in April, 1927.

Abstracts from Current Literature

A Simple Color Test for Bromine in Body Fluids. G. H. Belote, J. A. M. A. **88**:1696 (May 28) 1927.

The test is carried out as follows: Small strips of filter paper are soaked in a saturated solution of fluorescein in 60 per cent acetic acid. These are then allowed to dry and may be kept indefinitely as indicators of the test. The suspected body fluid is placed in a test tube. To this are added a few crystals of potassium permanganate. After agitation, a few drops of concentrated sulphuric acid are added and the fluorescein paper is held, after moistening with 2 per cent acetic acid, at the mouth of the test tube. The presence of even minute amounts of bromine is at once indicated by a rapid change in color from the original yellow to a bright pink on the paper. The presence of chlorine and iodine in no way interferes with the detection of bromine in this test.

The test is delicate and is a useful diagnostic procedure in suspected bromine intoxication.

Antimony and Potassium Tartrate in Chancroidal Infections: Results of Intravenous Treatment. A. E. Jones, J. A. M. A. **88**:1699 (May 28) 1927.

Excellent results are reported in twenty-seven patients treated by this remedy. The dose was 3 cc. of a 1 per cent solution (increased to a maximum of 10 cc.) at four day intervals. Mild to moderate general reactions from the treatment were encountered. The usual local measures were carried out conjointly with the administrations of antimony and potassium tartrate.

Chancre of the Nasal Septum: Report of Three Cases. E. P. Zeisler, J. A. M. A. **88**:1702 (May 28) 1927.

Zeisler has encountered the three cases he reports during a five year period. Probably this localization of extragenital chancre is not as rare as it is presumed to be. Warning of the possibility of chancre in any erosive lesion of the nasal mucosa is given.

Report of Three Hundred Thousand Kahn Tests. R. L. Kahn; P. L. Kendrick, and J. L. Landau, J. A. M. A. **89**:84 (July 9) 1927.

This report, from the laboratories of the Michigan Department of Health, summarizes a comparative study of the Kahn and Wassermann reactions, as well as the experience of these laboratories since the Wassermann test was abandoned in favor of Kahn's method. Comparison of the two tests in about 175,000 examinations showed disagreement in less than 1 per cent and indicated a greater degree of sensitivity of the Kahn reaction. In syphilitic patients who have been treated, the precipitation procedure was also more sensitive. The Kahn reaction is a dependable laboratory method and has advantages over the Wassermann test of simplicity, noninterference by anticomplementary substances and greater speed of reading. In emergencies, the result of the Kahn test can be reported in one hour.

Treatment of Neurosyphilis by Malaria: Report on the Three Years' Observation of the First One Hundred Patients Treated. P. A. O'Leary, J. A. M. A. **89**:95 (July 9) 1927.

Of the 100 patients, fifty-seven were paretic and of these about 50 per cent now show complete remissions, and 18 per cent decided improvement. In thirteen cases of paresis sine paresi, benefit was obtained in six. In cases of tabes dorsalis, the results were no better than with routine measures, except that gastric crises

and lightening pains responded more definitely. In seven cases of optic atrophy only slight decrease in vision has occurred in three, in comparison with that noted previous to the course of fever, while in four loss of vision was progressive.

The treatment directly or indirectly caused the death of five patients. Malaria therapy, according to the author, is contraindicated in debilitated or senile patients. The earlier in the disease that malaria treatment was instituted, the better the results obtained.

Serologic improvement does not always parallel clinical improvement; the former becomes more evident the longer the period of observation. The author regards changes in the colloidal benzoin and gold tests as of considerable prognostic significance. O'Leary considers malaria therapy the most valuable treatment for parenchymatous neurosyphilis at present; it requires hospitalization for at least one month because of close observation and emergency measures sometimes necessary.

THE RELIEF OF ITCHING BY EPINEPHRINE IN CERTAIN CASES OF INFANTILE ECZEMA. J. D. PILCHER, J. A. M. A. **89**:110 (July 9) 1927.

The author suggests the hypodermic administration of epinephrine to fretful infants with eczema. He gives from 0.1 to 0.3 cc., and repeats the dose every three or four hours, if necessary. In about 75 per cent of his patients relief from the itching was obtained. He did not reach any conclusive opinion as to the influence of the drug on the disease itself.

OTOMYCOSIS: REPORT OF THREE CASES. P. M. LEWIS, J. A. M. A. **89**:112 (July 9) 1927.

Short clinical notes of the cases are given. Prompt cure followed the use of 2 per cent salicylated alcohol.

MICHAEL, Houston, Texas.

OBSERVATIONS ON THE IMPORTANCE OF SYMBIOSIS OR CLOSE ASSOCIATION OF DIFFERENT SPECIES OF ORGANISMS IN THE PRODUCTION OF CERTAIN BIOCHEMICAL PHENOMENA AND IN THE CAUSATION OF CERTAIN DISEASES AND CERTAIN SYMPTOMS OF DISEASE. A. CASTELLANI, J. Trop. Med. **29**:217 (Aug. 2) 1926.

Mention is made of a few dermatologic conditions in which the disease is due to more than one organism—trichomycosis nigra, trichomycosis rubra, stomatitis cryptococco-bacillaris, copra itch which has pustules due to pyogenic infection in addition to the itch mite, and yaws—the yellow crusts on nodular yaws being due to pyogenic cocci.

THE TREATMENT OF TROPICAL SORE. EDITORIAL, J. Trop. Med. **29**:410 (Dec. 15) 1926.

A brief summary of ulcerations due to leishmania tropica is given; the best results have been obtained with tartar emetic injections and advising the greatest care and all possible precaution in the use of phosphorated oil by injection, on account of its tendency to damage the liver.

JAMIESON, Detroit.

RINGWORM OF THE SCALP TREATED BY THALLIUM ACETATE EPILATION. G. B. DOWLING, Proc. Roy. Soc. Med. **20**:71 (May) 1927.

The technic advised by Buschke was followed; that is, a single dose of thallium acetate in sweetened water was given by mouth. The actual dose given in one case was 8 mg. per kilogram of body weight; in the other two, 8.5 mg. Four cases were presented. The patient should be carefully weighed, preferably twice on different days. The dose of thallium acetate must be accurately calculated to the nearest milligram and administered in water. Buschke found that mixing the

thallium with food was unsatisfactory, as the epilation partly failed. The hair begins to loosen on the seventh day, falls out rapidly between the fourteenth and nineteenth day, and is all out by the nineteenth day. Regrowth begins practically at once. A curious occasional feature in the early stage of regrowth is the presence of enormous numbers of exclamation-mark hairs scattered all over the scalp. The infected hairs seem to resist epilation more readily than do the normal hairs, but they usually fall a few days later. Toxic reactions were mild, and the patient was relieved by rest in bed. In practically every case the patients complained of pains in the lower limbs, with some loss of appetite in a few cases, and in one case headache was a transient symptom occurring at the time of epilation. The pains in the limbs occur about ten days after the dose, and pass off at about the time of epilation, from eight to ten days later. No symptoms of any kind have been observed in the first week. In Buschke's cases there were no toxic symptoms of any kind, and he was able to produce complete epilation with 8 mg. per kilogram of body weight. Therefore the conclusion is that: 1. The thallium used should be biologically standardized. 2. It should be freshly made and absolutely pure. 3. The patients should, if possible, be kept in bed throughout the treatment.

THALLIUM. W. E. DIXON, Proc. Roy. Soc. Med. **20**:77 (May) 1927.

Any immediate effect consists of a relaxation of plain muscle throughout the body, such as that of the bronchioles, the intestines and the uterus. Thallium has one remarkable action, which is not produced by any other metal; namely, that on the autonomic nervous system. It also exerts a small and relatively insignificant action on the medulla and spinal cord. Certain substances such as strychnine allow reflexes to pass through the spinal cord more easily than usual, and so far as can be judged by these experiments, thallium acts on the autonomic nervous system in much the same way. If the sympathetic nerve in the neck of a cat or rabbit is stimulated by a faradic current, dilatation of the pupil is produced, and erection of hairs and constriction of the ear vessels occur. If so weak a current is chosen that no obvious effects are produced, and if the animal then receives a small dose, of thallium, the same stimulation of the sympathetic nerve produces a noticeable effect. This effect is not peculiar to the sympathetic nerve in the neck, the principle applies to the whole autonomic system; normal stimuli are exaggerated under the influence of thallium.

The autonomic system is divided into two groups, the craniosacral and the sympathetic. The craniosacral nerves, such as those of the vagus to the intestines, bladder, and other organs are affected in the same way as the sympathetic nerves, though to a less degree. There are no other metals, and few, if any, drugs which produce this exaggerated action of the autonomic system. There is no other substance which acts like thallium in producing the characteristic alopecia in both men and animals. All animals, with the possible exception of the guinea-pig, when injected with thallium, lose their hair; the hair at first becomes less glossy, it is easily rubbed off, and later is shed. The alopecia begins on the nape of the neck and round the ears, and the last hairs to fall are those round the chin and nose. But besides this action, small doses of thallium stimulates the growth of the hair. In order to show this, two rabbits from the same litter were shaved on one or two areas; one animal was kept as a control and thallium was administered to the other.

A deficiency or an excess of suprarenal secretion might be responsible for, or associated with, certain alopecias. When an animal was fed with thallium and then killed, the epinephrine content of the suprarenal glands was found to be deficient. The dose which when given to the shaved animals stimulated the growth of hair, was slightly less than the dose usually given to produce alopecia; but if an animal was shaved and thallium was afterward administered every third day, the hair would be stimulated to grow in the shaved areas, while alopecia might occur on other parts of the body.

The author believed that large doses destroyed the hair follicles permanently, though animals had been kept alive for only six months after large areas of alopecia had appeared. Histologic examination of the skin in these cases, however, had shown complete degeneration of the hair follicles.

GUY, Pittsburgh.

THREE MASKED FORMS OF PLEUROPULMONARY SYPHILIS: PAUCILOBAR PNEUMOPATHY, PREDOMINANTLY BRONCHIAL; INSULAR MUTILATING CORTICOPLEURITIS; SLATE-COLORED SYPHILITIC PNEUMONIA (SCLEROGUMMATOUS CORTICOPLEURITIS). MAURICE LETULLE and JACQUES DALSACE, Ann. de dermat. et syph. **8**:129 (March) 1927.

Cases of the various types are described, with clinical and pathologic observations and photomicrographs.

CREEPING DISEASE. E. CAZENAVE, Ann. de dermat. et syph. **8**:164 (March) 1927.

The author has divided the published cases into three groups:

1. Those of the European and African type, in which the lesion is almost always single, and the parasite, 1 mm. long, is apparently the larva of a fly, perhaps the gastrophilus.

2. A Japanese type, in which the parasite seems to retrace its steps; it is a reddish nematode about 1 cm. long.

3. The American type, seen especially in Florida, with numerous lesions appearing simultaneously a few hours after infection. Here a small worm, 5 mm. in length, is causative. It can be found only in serial sections.

Cazenave reports a case of the European type, which was the original "creeping disease" described by Lee.

HISTOLOGY OF EPITHELIOMA TREATED BY ELECTROCOAGULATION. C. LAURENTIER, Ann. de dermat. et syph. **8**:178 (March) 1927.

In the case described, the outlying cancer cells escaped destruction.

ACRODERMATITIS PERSTANS CURED BY AUTOGENOUS VACCINE. H. OLTRAMARE, J. GOLAY and A. STAROBINSKY, Ann. de dermat. et syph. **8**:193 (April) 1927.

In a case of a year's duration, the palms, soles and several nails had been involved, with the usual stubborn resistance to all forms of treatment. Six months of intensive vaccine treatment were followed by an apparently complete cure.

THE STREPTOCOCCIC INFECTIONS OF THE EPIDERMIS STUDIED BY A NEW CULTURAL METHOD. H. HAXTHAUSEN, Ann. de dermat. et syph. **8**:201 (April) 1927.

In 1888, Beck showed that crystal violet destroyed staphylococci but permitted the growth of streptococci. Adding it to liquid and solid culture mediums, Haxthausen made cultures from seven areas of the normal skin in a total of ninety-two subjects. Streptococci were found in only seven of these. Among 204 cases, representing twenty-seven common dermatoses, and not including any cases of impetigo or anything known to be of streptococcic origin, streptococci were found in only thirty. They were found in sixty of sixty-eight cases of impetigo and ecthyma, including old cases in which the patients had been treated. They were scarce in cases of Jadassohn's staphylococcic impetigo and in pemphigus neonatorum, but were plentiful in sixteen of eighteen cases of intertrigo, especially in the retro-auricular type. Streptococci were present in forty of fifty-four cases of pityriasis simplex facei, in thirty-one of sixty-two cases of pityriasis simplex corporis and in twenty-eight of forty-two with pityriasis capitis, and apparently played an important part in certain of the so-called seborrheids. Although perhaps representing a secondary infection in

most of these cases, it was a complication of some importance; Haxthausen found streptococci in regional lymph nodes.

SYPHILIS UNDERGOING CLINICAL EVOLUTION WITH A SILENT SEROLOGY. C. LAURENTIER, Ann. de dermat. et syph. **8**:213 (April) 1927.

The author cites illustrative cases and concludes that clinically active syphilis in any stage may exceptionally be accompanied by a negative Wassermann reaction of the blood and spinal fluid. The reason for this remains obscure.

RECURRENT ERYTHEMA MULTIFORME (TRANSITION APPROACHING DERMATITIS HERPETIFORMIS) ACCOMPANIED BY URTICARIAL OUTBREAKS. P. LANZENBERG, Ann. de dermat. et syph. **8**:220 (April) 1927.

A case is described in a man, aged 50, in which urticaria had been present at times for a period of twenty years and polymorphous eruptions for ten years, with no discovered cause. Treatment with autogenous serum seemed effective.

THE ETIOLOGY OF IMPETIGO HERPETIFORMIS. FRANCOIS WALTER, Ann. de dermat. et syph. **8**:257 (May) 1927.

The author describes two cases of impetigo herpetiformis occurring in pregnant women, with signs of tetany. One came to necropsy, while the condition in the other cleared up following the injection of the blood of a normal pregnant woman. A man's blood had been injected previously, without benefit. Walter feels that the cause probably lies in a disturbance of the endocrine equilibrium.

DISSEMINATED MILIARY LUPOIDS. GREGOIRE DUWE, Ann. de dermat. et syph. **8**:293 (May) 1927.

A man, aged 32, had a condition of two years' duration, the trunk being especially involved. The clinical and histologic symptoms are described.

LIPOMATOSIS AND HYPERCHOLESTERINEMIA. C. LAURENTIER and A. VALDIGUIE, Ann. de dermat. et syph. **8**:297 (May) 1927.

In ten cases, the authors had always found a certain degree of hypercholesterinemia, apparently at least as constant and as important as in xanthoma.

BEGINNING PAGET'S DISEASE WITH AN UNDERLYING CANALICULAR EPITHELIOMA. G. BARBIER, Bull. Soc. franç. de dermat. et syph. **34**:150, 1927.

A woman, aged 52, had first noticed a slight lesion of the mammary areola five months previously. Histologic study revealed the epidermal structure of Paget's disease, with an underlying epithelioma, apparently supporting Pautrier's contention that the condition originates as a canalicular epithelioma, the skin being involved later. The question is debated by Pautrier and Darier in an interesting discussion.

MALIGNANT LYMPHOGRANULOMATOSIS OF THE ABDOMEN AND PELVIS (HODGKIN'S DISEASE OF ABDOMINAL TYPE). G. BARBIER, R. GAUTHIER and CAILLIAU, Bull. Soc. franç. de dermat. et syph. **34**:159, 1927.

A woman, aged 30, presented the first symptom resulting from rectal involvement, which had appeared ten months previously. The involvement had been rapid, and the left inguinal lymph nodes had become enlarged. A generalized prurigo had developed. The red blood corpuscles numbered 4,000,000 and the leukocytes from 4,200 to 4,600, with normal proportions and a 3 per cent eosinophlia.

PROLONGED EDEMATOUS VESICULAR ERYTHRODERMA DUE TO BISMUTH. MILIAN and LENORMAND, Bull. Soc. franç. de dermat. et syph. **34**:162, 1927.

A man had received injections of mercurial oil in April, and neoarsphenamine in June; from July to October twenty-five injections of a bismuth preparation were given. Following the last injection, a generalized erythema developed in plaques, with some morbilliform areas. It faded slowly, with desquamation. Roentgenologic studies showed the presence of intragluteal deposits, and mercury and traces of bismuth were found in the urine.

ERYTHEMA OF THE NINTH DAY DUE TO BARBITAL. MILIAN and LENORMAND, Bull. Soc. franç. dermat. et syph. **34**:164, 1927.

A man with an infected hand was given a dose of barbital which was followed in seven days by a generalized macular eruption. It faded, and was reproduced when more barbital was administered.

A CASE OF TRICHOPHTOSIS OF THE DORSUM OF THE FOOT. JEANSELME and BURNIER, Bull. Soc. franç. de dermat. et syph. **34**:168, 1927.

There was a large erythematosquamous patch with a vesicular border, accompanied by interdigital involvement. The organism found was *Trichophyton gypseum*, var. *granulosum*.

A CASE OF VEGETATING BROMODERMA. JEANSELME and BURNIER, Bull. Soc. franç. de dermat. et syph. **34**:169, 1927.

An infant, aged 4 months, had lesions on the face, scalp and forearms, of one month's duration. Since eight days after birth, the baby had been given colic medicine, which was found to contain bromides.

FATALITY DUE TO HEMORRHAGIC NEPHRITIS IN THE COURSE OF TREATMENT WITH BISMUTH. A. GALLIOT, Bull. Soc. franç. de dermat. et syph. **34**:174, 1927.

In this case, several series of an insoluble preparation of bismuth carbonate had been given intramuscularly. The last injection apparently had entered a blood vessel. It is urged that this accident be avoided by strict technic, and that the urine be examined frequently for signs of a latent nephritis.

THIEMIA IN CERTAIN DERMATOSES AND IN SECONDARY SYPHILIS. A. SEZARY and M. LEBLANC, Bull. Soc. franç. de dermat. et syph. **34**:176, 1927.

With a view to determining the activity of certain organs, especially of the liver and of the suprarenal glands, the ratio of oxidized sulphur to the total sulphur in the blood was determined in twenty-eight cases representing various dermatoses and in seven cases of secondary syphilis. Normally, 80 per cent of the total sulphur is oxidized. In two of six cases of acute eczema, the percentage was 73; in four, it was normal. In three of six cases of recurrent eczema the percentage was from 65 to 73, and normal in the remaining three. In two cases of seborrhoic eczema it was 65; in two, it was normal. It was 70 in pruritus with lichenification, 77 in generalized lichen planus, 66 in giant urticaria in a syphilitic patient, 62 in alopecia areata accompanied by eczema, 63 in psoriasis, 77 in xanthoma and in leukoplakia, 70 in Riehl's melanosis and from 53 to 68 in acute erythroderma. In a case of psoriasis accompanied by eczema, and in one of pityriasis rubra of Hebra and in a leukemid, it was normal, and also in two of the seven cases of syphilis, while in the remaining five syphilitic patients it varied from 48 to 76.

NEGATIVE SEROLOGIC REACTIONS IN A PATIENT WITH PAPULAR SYPHILIDS CONTAINING SPIROCHETES. C. SIMON and J. BRALEZ, Bull. Soc. franç. de dermat. et syph. **34**:180, 1927.

Negative reactions persisted in a man, aged 25, after two injections of neoarsphenamine.

ZOSTERIFORM NEVUS WITH COMEDONES: HISTOLOGIC STUDY. MONTPELLIER and COLONIEU, Bull. Soc. franç. de dermat. et syph. **34**:181, 1927.

The nevus occupied the right scapular region. It was pigmented, with follicular plugs. The histologic symptoms are described.

URTICARIA PIGMENTOSA OF THE ADULT TYPE. L. DANEL, Bull. Soc. franç. de dermat. et syph. **34**:183, 1927.

A man, aged 51, had first noticed the lesions in 1916. The case is described in detail, clinically and histologically.

SYPHILITIC PARAPLEGIA OCCURRING SEVEN MONTHS AFTER THE CHANCRE DURING THE COURSE OF TREATMENT. LENORMAND, Bull. Soc. franç. de dermat. et syph. **34**:187, 1927.

The patient had received fourteen injections of neoarsphenamine, of average dose, and nine injections of mercurial oil. The spinal fluid examination showed no sign of meningeal reaction, and the Wassermann reactions of the blood and spinal fluid were negative.

ULCERATED ANGIOMA OF THE FACE. MILIAN and DELARUE, Bull. Soc. franç. de dermat. et syph. **34**:189, 1927.

In an infant, aged 9 months, the rupture of a cavernous angioma apparently was spontaneous. The ulceration was extensive and deep.

SECONDARY SYPHILIS WITH NEGATIVE SEROLOGY. HUDELO and RABUT, Bull. Soc. franç. de dermat. et syph. **34**:195, 1927.

Among forty-one cases of recurrent secondary eruptions, the authors have found five in which the Wassermann, Hecht and Vernes reactions were all negative, and five others in which one or two of these reactions were negative. It is their impression that this serologic negativity in the secondary stage occurs almost exclusively during recurrences in patients who have been treated.

A CASE OF URTICARIA PIGMENTOSA OF BULLOUS TYPE. HUDELO, DUMET, CAILLIAU and BOISSAU, Bull. Soc. franç. de dermat. et syph. **34**:197, 1927.

A child, aged 7 months, had an eruption which was noticed first at the age of 7 weeks. It was generalized, and small bullae were found especially on the neck and extremities. The blood picture and histologic symptoms were suggestive of pseudoleukemia.

PIGMENTATION OF THE BUCCAL MUCOSA. HUDELO and RABUT, Bull. Soc. franç. de dermat. et syph. **34**:198, 1927.

A woman, aged 34, had an involvement of the mucosa of the cheeks, lips, gums and tongue of six months' duration. There were also hyperpigmented areas on the forehead, hands and vulva. Together with signs suggestive of congenital syphilis and pulmonary tuberculosis, there were evidences of involvement of the suprarenal gland.

A CASE OF CERVICAL ACTINOMYCOSIS. HUDELO, MONTLAUR and MORNET, Bull. Soc. franç. de dermat. et syph. **34**:201, 1927.

An infection, apparently of rural origin, occurred in a woman, aged 27, and was proved bacteriologically.

A Case of Lupus Pernio with Adenopathy and Osseous Lesions. Lortat-Jacob and Legrain, Bull. Soc. franç. de dermat. et syph. **34**:203, 1927.

The histologic symptoms suggested lupus erythematosus. There was an ossifying periostitis of the phalanges, and not the decalcification described by Schaumann.

Morphea Atrophica: Its Possibly Leprous Origin. Milian and J. Delarue, Bull. Soc. franç. de dermat. et syph. **34**:206, 1927.

A girl, aged 14, had had patches on the head and neck of about two months' duration. There was some hypoesthesia, and other clinical and histologic symptoms somewhat suggestive of lepra. Bacilli were not found.

Parkhurst, Toledo, Ohio.

Demonstration of Tubercle Bacilli in Tuberculids. O. Dittrich, Dermat. Wchnschr. **84**:734 (May 28) 1927.

Using the Ziehl-Neelson method, as described by Klingmüller, Dittrich succeeded in demonstrating tubercle bacilli in the following forms of tuberculosis of the skin: acnitis, two cases; folliclis, one case; dermatitis nodularis necroticans, one case; papulo-necrotic tuberculid, one case, and granuloma annulare, two cases. He believes that this is the first time that the bacilli have been demonstrated in the last named lesion. In the other lesions they were visible in surprising abundance, considering the small numbers in which they have heretofore been found.

Treatment of Actinomycosis with Iontophoresis. H. Behdjet, and O. Scherefeddin, Dermat. Wchnschr. **84**:736 (May 28) 1927.

Behdjet and Scherefeddin, of Constantinople, report success in the treatment of two patients with actinomycosis of the skin of the neck with iontophoresis. The positive electrode, dipped in a 5 per cent solution of potassium iodide, was applied to the site of the lesion and the negative electrode to the opposite side of the neck. A constant current of 4 or 5 milliamperes, increased gradually to 25 or 30 milliamperes, was used. In the first case, the treatments, given every other day, were of a half hour's duration. After five or six, the patient was so much improved that his relatives removed him from the hospital, against Behdjet's advice. In the second case the length of the early sittings had to be curtailed, because of pain. The patient left the hospital after twenty-five days and was under observation for two months, during which time the lesions did not recur.

Idiosyncrasy of the Skin. F. Šamberger, Dermat. Wchnschr. **84**:796 (June 11) 1927.

Šamberger maintains that idiosyncrasy of the skin consists in hypersensitiveness of the lymph-forming apparatus in the skin, either in whole or in part. This hypersensitiveness may be congenital, but in most cases it is acquired by prolonged irritation of this apparatus by substances increasing the flow of lymph, products of gastro-intestinal, endocrine or other disturbances, or by the direct action on the capillaries of the skin of substances that stimulate lymph production. Among these he mentions the juice of the primrose and the poisons brought into the blood by ingestion of putrid meat. The evidence of clinical experience, confirmed by Bloch's experiments, is that hypersensitiveness to a single irritant is the result of slightly toxic doses of a substance increasing the flow of lymph, and that hypersensitiveness to a number of irritants is induced by highly toxic substances. Hypersecretion of lymph in the region of the papillae forms, together with superficial inflammation of the skin, the pathologic basis of eczema. The clinical picture varies with the predominance of one or the other of these totally distinct components. The author recalls Bloch's recent research on primrose idiosyncrasy, in which he found that in sufficiently strong concentration the juice of this plant

produces eczema in all persons. Šamberger believes that the primrose juice contains a pyrogenic substance and a substance that increases the flow of lymph, and that the content of the latter depends on environmental factors and differs in different plants. The varieties in the clinical picture of primrose dermatitis reflect the concentration in the juice of the plant of the element that increases the flow of lymph. He believes, further, that streptococcus toxin also posesses both pyrogenic and lymph-increasing properties, and that the variations in the concentration of the substances responsible, respectively, for these properties, explain the different forms observed in streptococcus infection of the skin: when the inflammatory component dominates, erysipelas is the result; with hypersecretion of lymph, the picture is that of pemphigus neonatorum or of impetigo contagiosa. In treatment of patients with eczema, medicines that restrain lymph production would seem to be indicated.

EROSIVE BLASTOMYCOSES. M. MECKEL, Dermat. Wchnschr. **84**:817 (June 18) 1927.

Meckel, of Fabry's Clinic, reports the culturing of yeasts from the scales in 80 per cent of eight cases of erosive intertrigo located in the fold of the skin beneath the breast, twenty-six cases located in the inguinal and anal creases, and a few located in the crease above the mons veneris. The patients were mostly well nourished women, in middle life. Diabetes appeared to be a strongly predisposing factor. Inoculation experiments were made by rubbing pure cultures of yeast into the skin in the interdigital spaces, beneath the breasts and in the genitocrural folds in healthy women and in women with diabetes. They were negative in healthy women when the skin was left intact, and positive when it was scarified. In women with diabetes, they were positive under both conditions.

SKIN ERUPTION FROM EXPOSURE TO SUNLIGHT IN A PATIENT WITH HEMATOPORPHYRINURIA. H. HAXTHAUSEN, Dermat. Wchnschr. **84**:827 (June 18) 1927.

A man, aged 20, who, because of epilepsy, had taken 0.15 Gm. of luminal daily for a long time, developed an eruption resembling hydroa aestivale after a period of unusual exposure to sunlight. The eruption was limited to the face and the backs of the hands. The urine contained hematoporphyrin and was dark. The color was said to have been normal heretofore. On discontinuance of the drug and protection against light, the dermatosis disappeared promptly. The patient had not previously exhibited hypersensitiveness to light. Haxthausen believes that this case confirms the causative connection between hematoporphyrin and hydroa aestivale.

HEREDITY AS APPLIED TO THE SKIN. H. POLL, Dermat. Wchnschr. **84**:849 (June 25) 1927.

Poll tabulates inherited skin diseases under the heads of dominant, recessive, sex-bound and unexplained hereditary processes, and inherited disposition. Among those under the first heading, are localized albinism, neurofibromatosis, naevi, hypertrichosis, alopecia, dermatitis herpetiformis and hereditary clubbed finger. In the second group are universal albinism, scleroderma and acanthosis. We lack an absolutely certain case in human skin disease to be classified under sex-bound heredity, but anhidrosis appears to belong here. The hereditary process is unexplained in exudative and multiform erythemas, in anonychia and in brittleness of the nails. In eczema, seborrhea, acne vulgaris, psoriasis, keloid, sun dermatitis, urticaria, etc., the influence of heredity takes the form of predisposition. The workings of heredity, particularly as exemplified in the hair of crossbred animals, are discussed, and the interactions of gen and phan are treated in general and with special reference to the limitless vistas which they open up in understanding the influence of heredity on the skin and its appendages.

CARPENTER, Chicago.

DERMATOLOGIC ABSTRACTS

The Journal of the American Medical Association

End-Results in Breast Cancer. Five Hundred and Sixty-Three Cases. B. F. Schreiner, and A. T. Stenstrom, Surg. Gynec. & Obst. **44**:608 (May) 1927.

Statistics quoted by Schreiner and Stenstrom show definitely that results in operable cases are best obtained by radical operation followed by irradiation, although in some instances, irradiation alone has proved of curative value. In the hopeless, inoperable cases of cancer of the breast, radium and roentgen-ray treatment has made the remaining days of the patient more comfortable.

Negative Lepers: I. Persistence of Bacilli in Deep Foci. E. V. Pineda, J. Philippine Islands M. A. **7**:109 (May) 1927.

The fact that ten of eleven cases on the negative list were found bacteriologically positive at autopsy in smears from deeper organs, and that in nine of fifty-three cases smears of material aspirated from the femoral lymph nodes were positive, Pineda says, is in accord with the generally recognized fact that lepers are not necessarily bacillus-free when they become negative by ordinary methods of examination. The skin and, apparently, the spleen and the liver become negative comparatively early; while in other sites, especially the nerves, lymph nodes and testes, the infection tends to persist for a relatively long time.

Negative Lepers: II. Nasal Lesions. H. W. Wade and F. Solis, J. Philippine Islands M. A. **7**:111 (May) 1927.

Special attention is called by Wade and Solis to the importance of examining the nasal mucosa in cases becoming or having become negative under treatment. Of 600 first examinations of negative candidates, in which both skin and nasal mucosa were tested, 152 were positive from the nasal mucosa and twenty-seven were positive from this region only. Of 570 negative or nearly negative patients, fifty-five were positive from the septum. Of them twenty-nine were positive only from the septum.

Negative Lepers: III. Relapses. H. W. Wade and C. B. Lara, J. Philippine Islands M. A. **7**:115 (May) 1927.

Data on supposed relapses in negative cases at the Culion Leper Colony are given by Wade and Lara. Of 508 persons on the negative list, seventy-five (15 per cent) had suffered interruption because later they were found bacteriologically positive. Of sixty-four of these, 55 per cent did not show clinical evidence of reactivation.

Treatment of Rodent Ulcer by Trichloracetic Acid. H. Leslie-Roberts, Brit. M. J. **1**:794 (April 30) 1927.

Leslie-Roberts says that the superiority of trichloracetic acid in the treatment of patients with rodent ulcer lies in the fact that its action leads to complete coagulation of the cell contents. The compounds formed between the acid and the cell contents are nonhydrophil, and therefore do not tend to draw lymph out of the capillaries. Thus the acid converts the neoplasm into a solid block of dead tissue, which is gradually thrust out by the undergrowth of the healthy living cell of the epidermis.

Vascular Reactions of Skin to Injury: IX. T. Lewis and I. M. Harmer, Heart **14**:19 (April 20) 1927.

Observations made by Lewis and Harmer supply further and direct evidence that in urticaria factitia a substance having a histamine-like action is released

in the skin and gradually passes into the general circulation, there to act generally. The amount of substance released when the trunk is extensively whealed is calculated to be equivalent to about 0.1 mg. of histamine base. One third of this quantity of histamine base, introduced subcutaneously, yields a recognizable general reaction. The concentration of the released substance in wheal fluid is calculated, in terms of histamine, to be about 1 in 1,500,000, agreeing closely with previous determinations by other methods.

VASODILATATION ARISING FROM ANTIDROMIC IMPULSES, TO HERPES ZOSTER AND TROPHIC EFFECTS. T. LEWIS and H. M. MARVIN, Heart **14**:27 (April 20) 1927.

Lewis and Marvin state that when the skin presents a reaction consisting of local reddening, whealing and a widespread flare, or when it presents local reddening associated with blistering, the vascular reactions of the skin are the result of the release of a histamine-like substance in situ; this conclusion is intended to cover all such reactions, irrespective of their remote causes. Antidromic impulses passing along sensory nerves cause vasodilatation by releasing a vasodilator substance from the tissues which the sensory nerve supplies. Nervous impulses are capable of influencing the sizes of peripheral vessels in one of two distinct ways; namely, by a direct or relatively direct action, and by an indirect action in which a released vasodilator substance is the immediate cause of vasodilatation. Herpes zoster is due to antidromic impulses passing down the sensory nerves and releasing in the skin substances of a histamine-like nature. It is suggested that antidromic impulses are concerned in controlling metabolic or secretory activities of tissues supplied by them, and that trophic lesions, so called, are due to disturbances of this control.

ROENTGENOTHERAPY OF THE SYMPATHETIC SYSTEM IN SKIN DISEASES. J. GOUIN, and A. BIENVENUE, J. de radiol. et d'électrol. **11**:129 (March) 1927.

Gouin and Bienvenue used roentgenotherapy in 150 cases in which the skin disease was associated with disturbances of the sympathetic system. Good results were obtained in patients in whom pruritus was the predominant symptom. In nineteen cases of lichen planus, the pruritus vanished within one or two days after a single exposure, the eruption in three weeks. The treatment proved to be effectual in fourteen cases of polymorphic erythema and in two of parapsoriasis. Other measures or special diets were not employed. In twenty-four cases of psoriasis, the roentgenotherapy resulted in disappearance of the pruritus, while the eruption was not influenced. From 4 to 5 Holzknecht units are applied to the upper part of the spine at one sitting. Sometimes the lower part of the spine is also exposed. In certain cases, the sitting must be repeated. Local or general reactions were never observed with this method.

CLASSIFICATION AND TREATMENT OF TUBERCULIDS. J. SCHAUMANN, Bruxelles-méd. **7**:483 (Feb. 13) 1927.

Schaumann's paper is devoted to the study of tuberculids of tuberculous origin, and to that of paratuberculous lesions of the skin, such as lupus erythematosus, malignant lymphogranulomatosis, lupus pernio and multiple benign sarcoid. Various methods of treatment are discussed. Finsen baths are useful. Gradually increasing doses of tuberculin injected into or beneath the skin are of great benefit. Tuberculin combined with neoarsphenamine appears to be the preferable therapeutic method. Good results were cited from intravenous injections of a gold preparation. Ten injections of graduated doses, from 0.01 to 0.1 Gm. are given, once a week. Of the author's twenty patients with lupus erythematous treated in this manner nine were cured, and ten improved. In one case, the treatment failed. Cure of a case of lupus pernio with large doses of sodium cacodylate was recently recorded.

Society Transactions

NEW YORK ACADEMY OF MEDICINE, SECTION ON DERMATOLOGY AND SYPHILIS

Regular Meeting, March 1, 1927

M. B. Parounagian, M.D., *Chairman*

Leprosy. Presented by Dr. Hopkins.

A. G., aged 35, an Italian, had been presented at the meeting of Jan. 4, 1927. The following histologic report was made on a section of skin removed from the neck. "There is a slight parakeratosis in places, a moderate acanthosis, with a few round cells infiltrating the malpighian layer. The rete pegs are slightly elongated and wider than normal. The papillary layer of the corium shows moderate edema. This and the upper reticular layers show a moderate perivascular infiltration consisting chiefly of lymphocytes, a few plasma cells, and newly formed fibroblasts. A similar picture is formed about the follicles. Acid-fast staining revealed no bacilli." A repeated neurologic examination did not reveal any positive symptoms in the realm of subjective sensation.

DISCUSSION

Dr. Pollitzer: I discussed the case when first presented and have nothing to add. I understand that no report has yet been made on the section taken from the forehead, but that it will be ready in a few days.

Dr. Kingsbury: I do not see any clinical evidence of leprosy in the case.

Dr. Abramowitz: I do not see any evidence of improvement. I recall that one of the biopsies taken at the Vanderbilt Clinic a year ago was reported to show definite follicular involvement. That would not indicate anything one way or another. I still think that the condition is a type of parapsoriasis.

Dr. Wise: What was the report on the pathologic section without regard to symptoms of leprosy?

Dr. Hopkins: Slight parakeratosis and infiltration around the superficial blood vessels were reported, and little else.

Dr. Wise: I should think that compatible with a diagnosis of parapsoriasis but not with lepra.

Lupus Vulgaris Healed with Injections of Gold Thiosulphate. Presented by Dr. Abramowitz.

Ruth K., aged 13, a private patient, had been presented at the Brookyn Dermatological Society on April 19, 1926. Shortly afterward, she was given twenty-one intravenous injections of gold and sodium thiosulphate, 100 mg. each, twice weekly. Locally, applications of weak permanganate solution and boric acid ointment were made. Improvement was noted immediately, and healing of the lesions progressed, although slowly. The patient left for the Catskill mountains, and during three summer months did not receive any further injections. The lesions continued to heal, so that when the patient was again presented at the Brookyn Dermatological Society on Sept. 20, 1926, all the lesions, except a few on the forehead, were cicatrized. For the three months

prior to presentation, although all lesions were healed, about 100 mg. of this gold compound had been given every two or three weeks as a prophylactic, for previously the condition had usually been severe during the winter. The patient's face, at the time of presentation, was considerably scarred. Her health was good, and she had gained 26 pounds (11.8 Kg.) during the past year.

Photographs were submitted showing the patient's appearance before and during the treatment. Dr. J. F. Schamberg supplied the gold thiosulphate.

DISCUSSION

DR. BECHET: It is interesting to see a case of this type, for, according to my experience, treatment with gold and sodium thiosulphate gives much better results in lupus erythematosus. However, I had a case of disseminate lupus vulgaris of the Tillbury Fox type in which the patient completely recovered after eight or ten injections. Results from its use for nearly a year certainly warrant the statement that this remedy is a valuable addition to the armamentarium in combating these usually obstinate dermatoses. This is particularly true of lupus erythematosus.

DR. CHARGIN: I saw this patient some time ago when the condition was severe, and the result obtained is marvelous. The patient, when first seen, had a mass of ulceration. I do not attribute the remarkable result to the gold thiosulphate, however, for the drug has little effect on lupus vulgaris of the skin. It is more than likely that the other measures employed are largely responsible for the good result obtained.

DR. ABRAMOWITZ: The only local treatment used was dressings of weak permanganate for the ulcers and boric ointment for the crusting. The patient received altogether twenty-one injections, reinforced by capsules of gold chloride. I had to discontinue the latter because of the reaction.

ACRODERMATITIS CHRONICA ATROPHICANS AND HODGKIN'S DISEASE. Presented by DR. ANDREWS. (From the Memorial Hospital.)

G. P., a man, aged 51, gave a history of typhoid fever. One year prior to presentation, his tonsils had been removed because of rheumatic symptoms. For three years he had had swelling of the glands in the neck and dysphagia; he had lost 30 pounds (13.6 Kg.) and was very weak. Fourteen months previous to presentation a right epitrochlear node was removed, and was reported negative for Hodgkin's disease. For the past eighteen months, he had had severe itching of the skin. Five Wassermann tests were negative. There was no history of syphilis. Roentgenographic examination of the chest did not show evidence of intrathoracic disease. The blood count taken on Feb. 2, 1927, showed hemoglobin, 90 per cent; red blood cells, 5,000,000; white blood cells, 6,800; polymorphonuclears, 85; large lymphocytes, 4; small lymphocytes, 7 per cent; basophils, 1; transitionals, 3. The patient was given roentgen-ray treatment on the neck and groins on February 7 and 14.

Examination of the larynx and fluoroscopy of the esophagus did not show any lesions. The esophagoscope could not be passed beyond the superior constrictor muscle. The mucosa was swollen and red, suggesting pressure from nodes. The dysphagia was slightly relieved by roentgen-ray treatment.

The tongue was congested and fissured, with atrophic mucosa. There was anetoderma over the elbows and knees, with thinning of the skin of the extremities, through which the superficial veins showed prominently. The skin of the legs, feet, thighs and scrotum, and on the upper extremities was dull red, dry, thin, fissured and crinkled. Pulsation of the dorsalis pedis was palpable.

DISCUSSION

DR. ELLER: I do not agree with the diagnosis of acrodermatitis chronica atrophicans. The skin does not present the atrophy and the velvety feeling on palpation which is found in this disease entity. The lesions on the arms and legs fit in with the disease called erythroderma ichthyosiforme. Regarding the verrucous and keratotic condition of the plantar surface of the feet, I believe that this is due to the ingestion of arsenic, in spite of the history to the contrary. It was interesting to note that this patient also probably had Hodgkin's disease.

DR. WOLF: One symptom against the diagnosis of acrodermatitis chronica atrophicans is that the patient complains of itching. There is a type of Hodgkin's disease of the skin in which there are diffuse infiltrated plaques. Being on the extremities, the infiltration is not marked. The keratoses fit in with the intake of arsenic. I feel that the erythematous lesions on the extremities may be attributed to Hodgkin's disease.

DR. ABRAMOWITZ: From the clinical appearance, aside from the history, I think the man has an arsenical keratosis. I do not think the lesions on the arms and legs are characteristic of acrodermatitis chronica atrophicans. It is not typical of Hodgkin's disease or of any of the skin eruptions seen in Hodgkin's disease. It may be just an atrophy with scaling following some dermatitis, possibly arsenical in nature.

DR. WISE: I agree with Dr. Eller's interpretation rather than with that of Dr. Andrews. On superficial examination, there is a slight resemblance to acrodermatitis chronica atrophicans; but closer scrutiny reveals that instead of being wrinkled, atrophic, smooth and shiny, the skin is just stiff and hyperkeratotic. It seems to me that Dr. Eller's diagnosis is the better; the eruption resembles an acquired ichthyosis appearing in later life. One interpretation is that the physician who noted palmar keratosis prescribed arsenic, and that the keratoses the patient now presents are the result of the administration of arsenic for a preexisting keratoderma. With regard to Hodgkin's disease, I cannot see any indications of that disease on cursory examination.

DR. FRASER: I agree with Dr. Eller and Dr. Wise that the ingestion of arsenic has probably contributed to the production of the keratotic lesions on the palms and soles. Ichthyosis would not account for the enlarged lymph nodes. These may be an expression of Hodgkin's disease, but there is no evidence of Hodgkin's disease of the skin. I would suggest that Dr. Andrews request a revised histologic report. The statement made that the lymph nodes are negative is unsatisfactory. Does it mean that the nodes are normal? Nodes large enough to produce pressure symptoms are not normal.

DR. ANDREWS: I am glad to have these opinions and will do as suggested. I was not so much impressed with the suggestion that the keratosis is due to arsenic, for to me it looks as though the patient had had an exudative eruption of the hands and feet which has disappeared and left crusting, often seen in eczema. The legs and feet have a good deal of crusting, and the palms have a verrucous appearance. I do not see any typical arsenical keratoses, which are hard and can be picked out, leaving pits. The suggestion of Dr. Wise that this is a case of acquired ichthyosis seems more consistent with the clinical appearance than any other made thus far.

LEUKEMIA CUTIS (?). Presented by DR. ABRAMOWITZ.

P. B., aged 32, was born in the United States and was a brother in Alexian Brothers' Hospital, Elizabeth, N. J. He was presented through the kindness

of Dr. Oleynick, the attending dermatologist to that institution. The patient was in perfect health until about five months prior to presentation, when small pea-sized, red nodular lesions began to appear, first around the right wrist and then gradually over the whole body, except the palms, soles and scalp. According to Dr. Oleynick, the color of the nodules, at first red, changed to orange yellow and showed some slight scaling. None of the lesions had disappeared at any time, although they gradually increased in number. There were no subjective symptoms. The pharynx showed two pea-sized, slightly pedunculated lesions of the same color as the surrounding mucous membrane. Dr. Oleynick had one of the skin nodules excised and examined histologically, and the report received stated that the chief changes were in the corium in which there was a dense collection of lymphocytic foci and obliteration of the papillae, with consequent pressure atrophy of the epidermis in all its layers, except the horny layer, which showed a mild keratosis. There were no giant or epithelioid cells. All laboratory examinations, including the Wassermann tests and the blood count, were negative.

DISCUSSION

DR. POLLITZER: The case is not simple. After excluding a number of conditions that have been mentioned, and also the small nodular form of leprosy which I thought of, I am inclined to regard it as one of leukemia of the skin, notwithstanding the negative blood symptoms and the absence of itching. The section, which I examined in unfavorable circumstances, shows a distinctly leukemic infiltration. At any rate, it is a picture of a granuloma, and my tentative diagnosis would be leukemia of the skin.

DR. LANE: I should like to ask if Dr. Fraser saw the section under the microscope.

DR. FRASER: No, but I was told that it was stained with methylene blue, which is an unsatisfactory stain. With proper preparation of the sections, a diagnosis should be possible from the microscopic picture.

DR. WISE: The case is unique in my experience, and I cannot diagnose it, but I would suggest that Dr. Abramowitz take several biopsies and roentgenograms of the lungs and other portions of the body, and also that he obtain repeated blood counts, and try to work up the case so that it may be more easily identified.

DR. WOLF: If it is a case of leukemia cutis or an aleukemia, there are certain things one would expect. Perhaps they are not present on account of the early stage of the disease. The patient does not present subjective symptoms of any kind relative to leukemia. I cannot conceive of such an extensive eruption without the presence of other symptoms. If it were a leukemic eruption, there should be a certain amount of itching.

DR. LEVIN: Of course a positive diagnosis of leukemia cannot be made without further study. I do not agree with Dr. Wolf that the absence of itching excludes leukemia. There is no history of subjective symptoms, at present. The conditions that came to my mind were: xanthoma and urticaria pigmentosa, which can be ruled out; it is not prurigo nodularis; I also thought of the possibility of leprosy, as Dr. Pollitzer suggested; it is not a toxic papular urticaria, and there is no itching or dermographia. The lesions are firm and deeply infiltrated; some of them are hard and distinctly tumor-like. The translucent and yellowish appearance made me think that the lesions were caused by one of the blood conditions. I believe further study will prove them to be lesions of true leukemia.

DR. ABRAMOWITZ: The condition impressed me as a possible leukemia of the skin or a leukemide. About four years ago Dr. Schuyler Clark presented a patient, a man, showing a continual normal blood count, with similar lesions on the face. One of these lesions, when removed, showed a typical leukemic infiltration under the microscope. There was no itching present in that case, either. Of course, the final diagnosis cannot be made without further study.

TINEA CAPITIS IN AN ADULT. Presented by DR. ANDREWS. (From the Vanderbilt Clinic.)

E. L., a white woman, aged 25, born in the United States, had noticed the condition of the scalp for the past three weeks. There was a spot the size of a quarter on the top of the head on which there were broken off hairs, scaling and crusting; this spot was slightly erythematous. On the right forearm was a slightly scaling, infiltrated lesion about the size of a quarter.

The examination for tinea was positive; culture showed *Microsporon lanosum*.

DISCUSSION

DR. BECHET: These cases are interesting, particularly when the condition occurs in white persons. Most of the cases of adult tinea capitis reported are those of colored people. Dr. Fox has presented several and I one — all of which occurred in negroid persons. There does not seem to be any plausible explanation for this predilection.

DR. PAROUNAGIAN: I had a case in a white patient, 30 years of age, the only case of the kind that I have seen.

KERION CELSI: LICHEN TRICHOPHYTICUS. Presented by DR. ANDREWS. (From the Vanderbilt Clinic.)

S. F., a white boy, aged 6, born in the United States, had had an eruption of the scalp for three weeks prior to admission to the clinic on January 24. The condition then was a superficial type of tinea capitis. The patient received an epilating dose of roentgen ray, and when he reappeared two weeks prior to presentation, he exhibited several infiltrated kerion lesions on the scalp and a generalized follicular eruption, especially on the trunk, showing occasional confluent and fine scales.

Microscopic examination of the lesions on the body did not reveal a fungus.

DISCUSSION

DR. SCHEER: It might be well to examine the blood for fungi; in some of these cases they have been found in the blood. Was the child ill? In some of these cases the patients have had fever for some days and have been ill.

DR. POLLITZER: I agree with the diagnosis.

DR. ANDREWS: A blood culture has not been made, but it will be made later.

LICHEN PLANUS ANNULARIS IN A PATIENT WITH TERTIARY SYPHILIS. Presented by DR. PAROUNAGIAN and DR. MASON.

H. G., aged 35, was referred to the clinic for treatment of syphilis of ten years' duration, which was complicated with aortitis. He presented a more or less generalized eruption, which was mostly annular and was said to be of one year's duration. All of the lesions were brownish purple and annular, with small papular shining borders and clearing central portions. These were of various sizes, and some were oval. On the anterior surface of both wrists

and on the lower third of both forearms were several discrete polyhedral papules with flat shiny tops. In the older lesions, only pigmented areas were noted. The Wassermann examination on two occasions was positive; but a course of antisyphilitic treatment with injections of neoarsphenamine and of mercury did not produce any improvement in the patient's cutaneous lesions. He did not complain of itching.

EPITHELIOMA OF THE SHAFT OF THE PENIS (?). Presented by DR. CHARGIN.

J. L., aged 62, a food handler, admitted having had gonorrhea when 19 years of age, but said that he had not had a chancre or secondary lesions. Several Wassermann tests were negative. The lesion presented had developed about eight months previously and had since gradually increased to the size shown.

The ulcer was slightly raised and was located on the skin of the shaft of the penis, behind the corona, and running diagonally along the shaft. It was almond-shaped and felt hard; the edges were somewhat raised and irregular. The floor of the ulcer was irregular and showed a few granulations. The lesion was painless. Examination did not reveal *Spirochaeta pallida* but many *Spirochaeta refringens* organisms. The Wassermann test was negative. The inguinal glands were enlarged.

DISCUSSION

DR. FRASER: I agree with the diagnosis of carcinoma.

DR. RULISON: The patient told me that the physician had ordered the use of nothing but salt water, but that he had made a solution of mercuric chloride and was treating himself, with marked improvement. I think that the condition may be syphilitic.

DR. ROSEN: The case is interesting from one angle. It is claimed that carcinoma of the penis is rare in persons who have been circumcised. According to the patient's history, he was circumcised at the age of 20.

DR. POLLITZER: With reference to Dr. Rosen's remarks, it may be interesting to recall that about fifty years ago Dr. Jonathan Hutchinson, as the result of his extensive observations, published the statement that carcinoma of the penis was rare in Jews. He attributed their relative freedom from carcinoma to the practice of circumcision.

DR. ELLER: I do not know whether this an epithelioma or not. The diagnosis should be determined by microscopic study. If it is a carcinoma of the penis, the glands have become enlarged rapidly.

DR. PAROUNAGIAN: The lesion is almost too hard for a gumma, and I rather favor the diagnosis of epithelioma.

DR. CHARGIN: Referring to the remarks of Dr. Rulison, it should be pointed out that the lesion is clinically not a chancre, that the examination for *Spirochaeta pallida* was negative, and that if the lesion is a chancre, secondary lesions should be present by this time. Nor is the lesion a gumma clinically, as it lacks the edges, is much too hard and lacks the gummatous infiltration. The glandular enlargement may be accounted for on the ground mentioned by Dr. Lane. I hardly regard the glands as metastasis. If the patient will permit, section will be made and reported on later.

A CASE FOR DIAGNOSIS (SCLERODERMA?). Presented by DR. MCCAFFERTY. (From the Vanderbilt Clinic.)

A. P., aged 38, a married woman, born in Italy, said that the condition presented began two years previously as a pea-sized, flat, pigmented spot on

the forehead near the hair line; it gradually spread downward and became depressed. In daylight, a lilac border and infiltration were not present. The Wassermann test had not yet been made.

DISCUSSION

DR. ELLER: I think that the condition is the atrophic or end stage of a patch of scleroderma.

DR. LEVIN: The condition is the atrophy following absorption of a patch of scleroderma.

A CASE FOR DIAGNOSIS (DRUG ERUPTION?). Presented by DR. CANNON. (From the Vanderbilt Clinic.)

I. R., a colored girl, aged 6, had had a skin eruption for the past two months. On the extensor surface of the elbows and knees and about the buttocks were sharply marginated patches, the size of a palm and larger, not elevated, grayish and giving a sensation of roughness to the touch. Just below the right elbow was a circular dime-sized patch, consisting of scratched (apparently) vesicles. Examination for tinea was negative. The patient had not had treatment.

DISCUSSION

DR. WISE: I cannot make a diagnosis, but in view of the alleged ingestion of Ex-Lax tablets for a considerable period, it is possible that the eruption is due to phenolphthalein. In negroes, any disease which is flat and macular is more liable to become follicular than in the white race, and that is not against the diagnosis of phenolphthalein eruption.

DR. GOODMAN: I think that the diagnosis of fungus disease should be excluded.

DR. LEVIN: I thought the case might be like one of those described by Pardo some years ago. It showed an exaggeration of the follicular eruption. It does not fit in with phenolphthalein eruption. I think it is caused by a fungus infection of the skin.

DR. ABRAMOWITZ: I am not inclined to agree with the diagnosis of phenolphthalein rash. I have not seen a single authentic case in a colored person. The patches in this patient are made up purely of follicular lesions, and might be a lichen scrofulosorum or a seborrheic dermatitis. I think a biopsy would be of help in this instance.

NOTE.—After the meeting, I took the pains of going through all the histories of phenolphthalein rashes, as indexed in the *Journal of Cutaneous Diseases* and the ARCHIVES OF DERMATOLOGY AND SYPHILOGY, since my first report in 1918. I find Dr. Wertheimer reported before the Pittsburgh Dermatological Society such a rash in a colored woman, aged 38, but the diagnosis was not unanimously accepted (ARCH. DERMAT. & SYPH. **10**:796 [Dec.] 1924). Dr. Fred Wise saw one definite case recently presented before the Manhattan Dermatological Society. It is possible that persons of the colored race are not susceptible, that they do not commonly take phenolphthalein laxatives, or that they pay little attention to such lesions when they occur.

DR. WISE: I should like to correct an impression given by one of the speakers about the ability of phenolphthalein to produce a keratotic type of follicular lesion. It can do so, though it does not always produce keratotic lesions. Dr. Abramowitz once reported the case of a girl with lesions of follicular keratoses caused by phenolphthalein.

DR. HOPKINS: I had the opportunity to see some of the patients described by Dr. Pardo-Castello. The condition was not like that in the case presented by Dr. Cannon. The patients showed patches of depigmentation on the face with slight pityriasis. There were no follicular lesions.

DR. PAROUNAGIAN: I was inclined to favor the diagnosis of a parasitic infection. It would seem that if results of the microscopic examination are negative, a therapeutic test might be made.

DR. LEVIN: I do not wish to give the impression that only erythematous lesions occur in phenolphthalein eruptions. The point made by a previous speaker about Dr. Abramowitz' case was that it showed an erythematous condition. In this case there is no serous exudation and no tendency to an eczematoid condition. Hyperkeratosis may be present in the phenolphthalein eruption, but it is not of this type of hyperkeratotic follicular papules.

DR. CANNON: With the exception that it is more deeply pigmented, a phenolphthalein eruption in a negro is not different from the same condition in a white person. I have seen five or six cases of phenolphthalein eruption in colored patients — two during the past three weeks. In each instance, the lesions have been almost black, much darker than the surrounding skin. While follicular lesions are occasionally encountered, as a rule they are associated with the characteristic erythema multiforme-like pigmented lesions, and are apt to be inflammatory, moist and even scaly.

DR. ELLER: I hope that Dr. Cannon will give the patient some phenolphthalein and report the result.

A CASE FOR DIAGNOSIS (MUCOUS RETENTION CYSTS?). Presented by DR. GOLDBERGER.

L. J., a colored boy, aged 11, did not give a history of past illnesses. The Wassermann reaction was negative. The mucous surfaces of both lips were covered with small hempseed sized lesions, flattened and somewhat elevated above the level of the lips. Fluid could not be obtained from the lesions when pricked. His mother said that the condition had been present for eight months. Subjective symptoms were not present. The biopsy report was "buccal mucous membrane."

DISCUSSION

DR. BECHET: I think the papillomatous lesions on the buccal mucous membrane are ordinary warts. They are raised, whitish, noninflammatory and seem typical. The scaly condition of the lip, I think is another entity. The diagnosis of cheilitis glandularis is a possibility.

DR. CHARGIN: I think the small masses on the lips and adjacent mucous membrane in the case of this child are retention cysts. I see nothing that suggests cheilitis glandularis. Cheilitis and the characteristic follicular openings with dilated mouths were absent.

DR. POLLITZER: I thought the whitish tumors belonged to the class of Fordyce's disease — misplaced sebaceous glands. The lesions are not cystic in appearance, and to my mind, there is no suggestion of cheilitis glandularis. The lesions in this case occur on the mucous membrane of both the mouth and the lips.

DR. WISE: Had I known that the diagnosis of warts would be considered, I would have examined the lesions more closely. I think, with Dr. Chargin, that they are retention mucous cysts and contain gelatinous material. As to cheilitis glandularis, I do not know of any reason why the two should not be combined.

Some of the ducts are retention cysts; in others, the lumen is open, and there is a glairy discharge; hence there is no reason why the diagnosis of retention cysts with cheilitis glandularis should not be considered.

DR. WOLF: The case has been seen in the daylight by several men, and attempts have been made to open the cysts and to obtain some cystic fluid. They were not successful. In the daylight, the lesions look like verrucous papillomas, and I think this was the general opinion of the case at Mount Sinai Hospital.

DR. CANNON: The lesions in Fordyce's disease are slightly raised, flat, soft and yellowish, while in this instance they are hard, papular and verrucous. I think they are warts of the mucous membrane.

DR. LEVIN: The lesions first suggested flat warts. Closer examination, however, reveals the fact that when opened fluid exudes, which dries to form crusts on the surface; such lesions may be seen near the left corner of the lower lip. I agree with the diagnosis of retention cysts as made by Dr. Chargin.

DR. POLLITZER: I think I heard something about a biopsy?

DR. GOLDBERGER: It was unsatisfactory. The report was only "buccal mucous membrane."

In connection with this case, I would recall the fact that at the last meeting I presented one similar to it. The diagnosis which was made by me was that the condition was probably cheilitis glandularis, but later I came to the conclusion that the condition was lupus erythematosus of the lower lip. The microscopic report from the Vanderbilt Clinic strongly suggests lupus erythematosus with a slight roentgen-ray dermatitis. Dr. McCarthy of Washington also looked at the slide and arrived at a similar microscopic diagnosis.

SYPHILIS (UNUSUAL). Presented by DR. ROSEN.

D. B., aged 45, an Italian painter, was married and had five living children. His wife had not had any miscarriages, and he said that he had not had venereal infection. Up to eighteen months previously he had never been ill. At that time he noticed painless swellings in both flanks. These were followed by others in other parts of the body. He lost weight and felt sick, and had had a daily rise in temperature since the beginning of the illness. He had been under the care of a physician, who injected some "tonic" intravenously —in all about one hundred injections. The patient claimed that the lesions were uninfluenced by these treatments.

On admission to Mount Sinai Hospital, the patient presented a large number of tumors and infiltrations, both superficial and deep-seated. The overlying skin in some areas was dark red and smooth, and in others was scaly and crusted. In both cubital fossae and extending outward, were hard infiltrations involving the muscular structures, which gave the impression of extending to the bones, but roentgen-ray examination proved negative. The glans penis showed a deep excavated scar of recent origin. Ulcerations were still active on the roof of the mouth and on the inner surfaces of the cheeks. On physical examination, it was found that the liver and spleen were enlarged and that the epitrochlear, cervical and inguinal lymph nodes were also markedly enlarged. Neurologic examination was normal; a lumbar puncture was refused. Repeated Wassermann tests were negative with all methods. Differential blood counts were likewise negative. Microscopic examination of one of the deeper seated lesions in the lumbosacral region showed an unusual histologic picture. The infiltration, which was diffusely scattered in the adipose tissue, consisted of

lymphocytes, plasma cells and peculiar multinucleated bodies. The vascular changes were not so marked, and the whole picture did not give the impression of a syphilitic process.

The patient was given one injection of neoarsphenamine, 0.3 Gm., following which an erythematous eruption with a rise in temperature appeared. This treatment was discontinued because of the reaction, and biweekly injections of bismuth were substituted. After the third or fourth injection, there was a marked improvement in all the lesions; the temperature subsided, and the patient's general condition had changed so much for the better that in spite of the negative symptoms it was felt that the therapeutic test substantiated the diagnosis of syphilis. After six weeks of treatment with bismuth, all the skin lesions except subcutaneous, lipoma-like tumors had disappeared, and the ulcerations in the mouth were entirely healed. The liver and spleen were markedly reduced in size, and the patient had gained 15 pounds (6.8 Kg.) in weight. He was discharged from the hospital, and for the first time in eighteen months he was able to resume his occupation.

The case was shown on account of the unusual clinical and pathologic pictures, the repeated negative Wassermann tests and the rapid response to comparatively mild antisyphilitic treatment.

DISCUSSION

DR. FRASER: I agree with Dr. Rosen's diagnosis, and I think the condition is syphilis. I have not seen the slides, but I listened carefully to the pathologic report read by Dr. Rosen. There is nothing in this report which would exclude syphilis. Clinically, syphilitic lesions resemble those of almost every other disease. The histologic picture of a syphilitic lesion may also resemble that of other diseases, but in this case it suggests syphilis.

DR. CHARGIN: I think this is an unusual case. I have observed the patient from the time he was first admitted to the hospital, and thus I have had opportunity to follow the course of the disease. The evidence submitted by Dr. Rosen, namely, the deep-seated tumor masses in the subcutaneous tissue, the miliary gumma-like lesions on the penis and soft palate, the ulcerations in the mucous membranes of the cheeks, the remittent temperature lasting for a year and a half and the enlarged liver, all of which cleared up completely or greatly improved within a short period of time under antisyphilitic treatment, I believe proves the case to be one of syphilis, despite the negative Wassermann tests. The encapsulated tumors under the skin which did not respond to antisyphilitic treatment must be regarded as associated fatty tumors.

DR. MCCAFFERTY: I was especially interested in the remarks Dr. Rosen made regarding the lipomatous-like tumors in his patient. Four or five months ago, there was a patient at the Polyclinic Hospital who presented two small lipomatous lesions on his forearms; in addition to these, the patient had a positive Wassermann reaction and desired treatment. At the time, the question of having these lipomas removed surgically was considered, but it was decided to wait until the treatment had been finished. These two lipomatous lesions disappeared during the course of the antisyphilitic treatment, and the conclusion was drawn that they were of syphilitic origin.

DR. LEVIN: I saw the patient when first admitted to Mount Sinai Hospital, and I wish to correct one point. The diagnosis made was tertiary syphilis. The diagnosis made before the patient came to the clinic was leukemia. After the patient was admitted to the hospital, he was given 0.3 Gm. of neoarsphenamine, followed by immediate improvement and the disappearance of more than

50 per cent of the lesions. Then the temperature shot up to 104 F., followed by an erythematous eruption. Since then the temperature became and remained normal. Arsphenamine was stopped and bismuth was given. There is no doubt that the lesions will all disappear under treatment with bismuth. The pathologic process is that of a gumma in the fatty tissues, as described by the pathologist at Mount Sinai Hospital.

DR. SCHEER: I saw the patient with Dr. Strumwasser before his admission to Mount Sinai Hospital, and the picture was the same as that Dr. Rosen gave. The patient said that during the entire period of his illness he had been receiving injections of some sort—both subcutaneously and intravenously. The diagnosis of syphilis was made on account of the ulcerated lesion on the glans and the ulcer on the hard palate. The fever was interpreted as being due to syphilitic hepatitis, which may give rise to protracted fever.

SECONDARY SYPHILIDE RESEMBLING CHANCRE. Presented by DR. CHARGIN.

D. W., aged 27, salesman, unmarried, was first seen at the clinic in October, 1925, with a typical chancre located on the shaft of the penis, in which many *Spirochetae pallidae* were found. He also showed a generalized though scattered papular syphiloderma. The Wassermann test was four plus. He received fourteen injections of arsphenamine and twenty-six injections of bismuth, and then remained away without permission.

He returned, seven months after his last treatment, with a penny-sized lesion on the shaft, not in the location of the original chancre. Careful examination showed that this lesion was evidently made up of several papules which had coalesced, and clinically the lesion could easily be mistaken for a chancre. The sore had a somewhat indurated base. In addition, there were a few definite, pea-sized syphilitic papules on the shaft behind the chancre-like lesion.

DISCUSSION

DR. POLLITZER: On close inspection of the penile lesion I find that it does not look like a chancre, but that it appears to be an annular group of papules, moist and oozing; not really an ulceration, but a superficial erosion of an annular group of papules. One would think of chancre only on account of its location.

DR. PAROUNAGIAN: This subject always interests me. The history is clear. The infection had been present a year and a half. The patient had sufficiently good treatment for one course; then he stayed away, as many do. He has been exposed frequently, and a new lesion appears on a different location than the original chancre. The new lesion is sharply marginated, raw, eroded, and if there was no previous history of chancre, no one would hesitate to make a clinical diagnosis of chancre. Dark-field examination has revealed *Spirochetae pallidae*. There are two conditions to consider in this case — either reinfection or superinfection. In the first instance, if the Wassermann reaction was negative when the patient came under observation with the second genital sore, if he has had sufficient treatment to bring about a probable cure, if the dark-field examination becomes positive and if his Wassermann reaction gradually becomes positive, I would be inclined to regard this case as one of reinfection. On the other hand, if his Wassermann reaction was positive, with the history of frequent exposures and a new lesion on a new location, and with positive dark-field examination, the condition must be regarded as a superinfection. It means that he had lost his immunity and was in a receptive state. As to the presence of secondary papules in the region of the new lesion, it is common to notice secondary lesions on the genitals first.

If Dr. Chargin would abstain from treating this patient, I feel confident that he would develop secondary lesions within two months as in his first infection, which would settle the question.

DR. CHARGIN: I presented the case because at first glance one could readily mistake the large lesion in this case for a chancre. As Dr. Pollitzer pointed out, it is not a chancre. Although several lesions were examined by the dark-field, only a lone spirochete was found, and one would expect more in a primary lesion. The moist character of the lesion is accounted for by the eroded character of the papules and by the fact that but a few hours ago the lesions were scraped for the purpose of the examination. It is hardly likely that the lesion is a chancre, be it considered superinfection or reinfection in a patient who at the same time shows definite syphilitic papules in another location on the penis. The chancre-like lesion is explained on the basis of several papules having become confluent, eroded, and by virtue of irritation somewhat indurated.

PARAPSORIASIS. Presented by DR. HOPKINS.

J. F., an Austrian, aged 57, had had the eruption presented for the past three years. On the arms and trunk were rather sharply defined yellowish patches, varying in size from that of a finger-nail to that of a child's palm. The lesions were arranged in lines of cleavage, and showed slight scaliness and pseudo-atrophy. There was occasional itching.

MOTTLED CHIN OF SYPHILIS. Presented by DR. PAROUNAGIAN and DR. MASON.

A. T., aged 34, came to the clinic on Feb. 21, 1927, on account of an eruption on his face, particularly prominent on the chin. He said that he had not had venereal disease and complained of excessive itching, which caused some doubt about the condition being a case of Trimble's "mottled chin." Furthermore, the lesions were not mere pigmented macules but were discrete, circumscribed, scaly patches of various sizes, artistically arranged and making an interesting picture. Further examination revealed marked patches of seborrheic eczema on the scalp and on the sternum which almost led to the diagnosis of seborrheic eczema of the chin, but further search revealed a fine macular roseola on the body, a few lesions on the penis and history of frequent exposures. The Wassermann reaction on February 24 was reported to be four plus.

CHARCOT JOINT. Presented by DR. PAROUNAGIAN and DR. MASON.

L. S., aged 28, was admitted to the Bellevue syphilis clinic on July 16, 1926. He said that he had never had venereal disease nor any treatment for the same. His family history was negative, except that both parents died suddenly. His chief complaint was the swelling and pain in the joint of the right hip, the duration of which was said to be three years. The Wassermann test was four plus, and antisyphilitic treatment was administered, but his condition did not improve. A roentgen-ray examination on Feb. 11, 1927, confirmed the diagnosis of Charcot joint.

SQUAMOUS CELL EPITHELIOMA OF THE HAND. Presented by DR. WYETH.

CASE 1.—W. McL., aged 58, about four years before presentation had had a small wart appear on the index finger, which grew rapidly. In September, 1920, a diagnosis of epithelioma was made, and roentgen-ray treatment was instituted. In April, 1921, after an enforced absence of some weeks from the city, the patient came to the Vanderbilt Clinic. The lesion then measured about 3½ inches (8.87 cm.) in length by 2 inches (5 cm.) in width, with an elevation of from 1¼ to

1½ inches (3.12 to 3.7 cm.). The Wassermann reaction was negative. The patient had been advised repeatedly to have his arm amputated at the shoulder. It was decided to employ bipolar diathermy before resorting to the extreme measure of amputation. Under ether narcosis, the malignant area was isolated from the surrounding healthy tissue, and the lesion was coagulated in situ, cut out, and curetted down to a healthy base. Convalescence proceeded satisfactorily, and the patient had had no recurrence in more than five years.

Five years and nine months following the operation, the patient accidentally struck his elbow against the door, causing an open wound which ulcerated. This had grown progressively larger and had taken on an epitheliomatous appearance. Microscopic section showed it to be squamous cell epithelioma, grade 3. On Jan. 22, 1927, the patient was treated by bipolar endothermy. The wound is now healing.

Case 2.—M. W., a man, aged 52, had an extensive squamous cell epithelioma of the lower lip, grade 2. He was first seen on Oct. 28, 1925. About a year before presentation, the patient noted a pimple that appeared on the lower lip, broke down and began to spread. This had increased in size despite various treatments. The patient stated that within the preceding two weeks, it had increased rapidly, and he was "going down hill."

On examination the lesion had progressed and involved the whole lower lip, down to the sulcus in the chin. It was a crater-like epitheliomatous growth which had already perforated, saliva going through the opening. On the left side, one submaxillary nodule was rather markedly enlarged and somewhat fixed. There were three submaxillary enlargements on the right side, but all were freely movable.

The patient was operated on October 30, under rectal anesthesia. The entire lesion was surrounded and destroyed by bipolar endothermy and excised with the endotherm knife.

The lower lip filled in quickly except for a granulating area on the mucous membrane about 3 by 2 cm. below the teeth. Nodules on the right side of the neck and the submaxillary gland on the left side were completely reduced. The patient was given roentgen-ray treatment to both sides of the neck.

A plastic operation was performed by Dr. Sheehan on March 8, 1926. Two weeks later, the patient returned with a marked recurrence of the epithelioma. He was again treated by surgical diathermy, and it will be necessary to perform another plastic operation.

Squamous Cell Epithelioma of the Tongue. Presented by Dr. Levin for Dr. Sayer.

R. S., a Russian woman, aged 51, complained of a painful ulceration of the tongue, first noted eight months prior to presentation. At the middle of the left border and under the surface of the tongue was a large irregular ulcer with elevated, infiltrated borders. On the under surface of the tongue and extending to the floor of the mouth was a dense hard tumor. Adenopathy was not present. The teeth were poor and ragged. The unusual feature was the occurrence of an epithelioma in the mouth of a woman.

Arsenical Keratosis. Presented by Dr. Andrews.

P. McC., an Irishman, aged 50, had been afflicted with the skin condition presented since boyhood. On the palms of both hands were numerous keratotic and verrucous lesions, also a few keratoses on the dorsum of both hands. Both soles showed decided hyperkeratosis. There was an erythematous eruption

of the face, a scaly condition of the scalp and a few scaly patches on the extremities. The Wassermann test was negative. Arsenic was found in the urine.

HAIRY TONGUE. Presented by DR. GOLDBERGER.

M. M., a Russian, aged 64, a heavy smoker and alcoholic, was under treatment at Mount Sinai Clinic for cerebrospinal syphilis. On the dorsum of the tongue was a yellowish-brown discoloration, and in the center of the discolored area was a furlike patch containing hairlike processes of unknown duration.

MULTIPLE CYST-ADENOMAS. Presented by DR. SHEER. (From the Mount Sinai Clinic.)

Mrs. A. M., aged 47, born in Ireland, came to the skin clinic for psoriasis. She also presented cystic lesions on the cheeks, lower eyelids and nose, which had existed for a year or two, and for which she was presented. The lesions consisted of firm vesicles varying in size from that of a pinhead to ⅛ inch (0.3 cm.) in diameter, the largest being on the inner canthus of the right eye.

ERYTHEMA INDURATUM TREATED WITH NEOARSPHENAMINE. Presented by DR. CANNON for DR. FEIT. (From the Vanderbilt Clinic.)

Mrs. L., aged 32, born in the United States, presented a typical example of Bazin's disease which had resisted treatment with the roentgen ray, ultraviolet radiation and various topical remedies. After the administration of nine injections of neoarsphenamine, 0.6 Gm. each, her condition improved considerably. After the second injection the patient had a severe local reaction consisting of erythema and painful swelling in and around the lesions, which confined her to bed.

DERMATITIS MEDICAMENTOSA (PHENOLPHTHALEIN). Presented by DR. SCHEER. (From Mount Sinai Skin Clinic.)

Mrs. E. G., aged 32, born in the United States, had had an eruption of one week's duration. She had been taking cathartics containing phenolphthalein. There were bullae on both elbow tips the size of a quarter, which had ruptured, leaving dark bluish-red pigmented spots. There were also bullae on the forearms and on the fingers of both hands, and there were remains of bullae on the hard palate and lips.

XANTHELASMA (ETENSIVE). Presented by DR. SCHEER. (From Mount Sinai Hospital Skin Clinic.)

R. G., a widow, aged 66, born in Poland, was referred by Dr. Berger of the eye clinic. The first lesions appeared two years previously, according to the patient, first on the neck and chest, then on the face and lastly on the eyelids. The lesions were typical of xanthelasma, the unusual feature being the wide extent of the eruption. There were lesions on both upper and lower eyelids, also large plaques on the face. They occupied almost the entire neck, except the midregion posteriorly, and extended over the clavicles. The urine was negative for sugar; blood cholesterol was 170 per cent.

DERMATITIS HERPETIFORMIS. Presented by DR. SCHEER. (From Mount Sinai Skin Clinic).

Mrs. G. B., aged 48, born in Russia, had suffered with exacerbations and remissions of the eruption for two years. The eruption was generalized, but

was most marked on the scalp, face, trunk and upper extremities, and showed a tendency to grouping. The lesions consisted of papules and vesicles, most of which were torn by scratching. There was little pigmentation. The itching, which occurred in exacerbations, was severe. The blood count showed: red blood cells, 4,160,000; white blood cells, 8,600; hemoglobin, 85 per cent. Differential count: polymorphonuclears, 56 per cent; mononuclears, 12 per cent; lymphocytes, 25 per cent; eosinophils, 7 per cent.

The patient was treated with injections of autogenous blood and ultraviolet light, with some relief.

BROMODERMA. Presented by DR. SHARLIT. (From the Vanderbilt Clinic.)

E. M., a negress, aged 34, born in the United States, had had the eruption for two months, and gave a history of ingestion of salty medicine for several weeks previous to the eruption. There were several slightly elevated, erythematous, nodular lesions which were not painful, on both legs. On the anterior aspect of the right leg was an irregular, palm-sized painful plaque. The periphery was infiltrated and somewhat boggy. At the upper portion was a granulating area; at the center of the lower half was a depressed and atrophic area.

KERATOMA PALMARE ET PLANTARE HEREDITARIUM. Presented by DR. WOLF. (From the Mount Sinai Skin Clinic.)

S. I., aged 18 months, presented a condition which the mother first noticed at the age of 4½ months. The palms and soles were symmetrically affected. The skin of the palms was thickened and of a leathery consistency. There was a tendency to exaggerated skin markings as well as superficial fissuring. The soles were smooth and of a yellowish translucent color. There was moderate hyperhidrosis.

LUPUS VULGARIS TREATED WITH PYROGALLIC ACID. Presented by DR. SCHEER. (From Mount Sinai Skin Clinic.)

Miss L. B., aged 19, born in Poland, had been in this country for five years. When she came to the clinic, she presented a disfiuring lupus vulgaris lesion on the neck. An area 3 by 6 inches (7.6 by 15.2 cm.) was involved, consisting of brownish-red elevated nodules with no ulceration. The entire area was raised about ¼ inch (.63 cm.) above the skin level.

Applications of pyrogallic acid, 10 per cent, removed all the hypertrophic lesions, and as shown the patient presented a smooth and pliable scar. There had always been a few lupus nodules in the scar.

ANGIOSARCOMA APPARENTLY CURED BY ELECTROCOAGULATION AND ROENTGEN RAYS. Presented by DR. WOLF.

M. K., aged 31, was referred by his physician on July 17, 1926. Six weeks prior to presentation, he had had "something removed from the left side of the back of the neck at a certain hospital because it used to bleed." He claimed that the lesion had been a mole. When examined, a grayish-blue globular growth, sessile at the base, was seen on the left side of the back of the neck. It was raised about 1 cm. above the skin and was 1.5 cm. wide. The posterior cervical gland was enlarged and not tender. The entire mass was removed by electrocoagulation, and the tissue was submitted for pathologic examination. He subsequently received deep filtered roentgen-ray irradiation to the site of the lesion as well as to the cervical glands.

The greater part of the tumor consisted of irregular polyhedral cells with one or more long cytoplasmic processes and large nuclei. The cells lay in a loose connective tissue stroma taking a metachromatic stain resembling mucin. The cells, however, were not the star-shaped cells of a myxomatous tumor. Throughout the section were large numbers of newly formed blood vessels and lymph channels; their walls were formed by cells similar to the tumor cells described, and they had the typical appearance of angioblasts. The tumor cells had no constant arrangement, the growth being irregular and disorderly. Mitotic figures were present but rare. The surface of the tumor was necrotic and infiltrated with polymorphonuclear leukocytes.

DERMATITIS MEDICAMENTOSA (PHENOLPHTHALEIN). Presented by DR. GOODMAN. (From the Skin and Cancer Hospital.)

P. J., aged 21, on Aug. 1, 1926, had noted a lesion on the dorsum of the right hand which persisted for three months, leaving pigmentation. About October, the left knee showed a similar lesion, which was greater in circumference and persisted for three months, leaving an area of pigmentation. In December, a small lesion appeared on the flexor surface of the right forearm, leaving a small area of pigmentation. Then there was a period of freedom from the lesions until Feb. 21, 1927, when numerous lesions appeared on the hands, forearms and legs. The lesions were circular, slightly elevated and pinkish, with a slight red crust in the center of each. The patient had chewed "Feenamint" gum for one and one-half years, and she recalled chewing this gum on Sunday prior to the appearance of the eruption presented, forty-eight hours intervening. The eruption corresponded to that of a phenolphthalein eruption.

GUMMA OF THE STERNOCLAVICULAR ARTICULATION. Presented by DR. PAROUNAGIAN and DR. MASON.

Mrs. K. H., aged 27, was admitted to the clinic on April 23, 1924, with a generalized roseola, condylomas about the genitals, and a four plus Wassermann reaction had been obtained at the laboratory of the health department as well as at the laboratory of Bellevue hospital.

In spite of three courses of neoarsphenamine and mercury a gumma of the sternoclavicular articulation developed, and the Wassermann reaction was four plus.

GUMMA ON DORSUM OF RIGHT HAND. Presented by DR. PAROUNAGIAN and DR. MASON.

T. C., aged 56, was first seen at the Bellevue Hospital Syphilis Clinic on Feb. 21, 1927, and at that time presented a circular superficial ulcer about the size of a five cent piece on the dorsum of the right hand. When questioned, he stated that a man bit him on Feb. 11, 1927, and caused the lesion. He had treated it with tincture of iodine. An initial lesion was suspected, and four dark-field examinations were made, all of which were negative. Chancre was excluded on account of the absence of induration, irregular borders and absence of lymphatics from the epitrochlear and axillary regions; also the incubation period was considered too short. It was difficult to obtain any history of a past infection, but careful examination revealed a slight scar at the frenum. He had not had a blood test nor treatment for syphilis before. His Wassermann reaction was reported four plus on Feb. 24, 1927. The Rhomberg sign was positive; the knee jerks were exaggerated, the pupils unequal and the right facial muscles flatter than the left. The lesion seemed to be a gumma precipitated by traumatism.

GEORGE C. ANDREWS, M.D., Secretary.

PHILADELPHIA DERMATOLOGICAL SOCIETY

March 4, 1927

ROSE HIRSCHLER, M.D., *Presiding*

LUPUS ERYTHEMATOSUS. Presented by DR. WEIDMAN.

M. M., a colored woman with Indian blood, aged 41, gave a history of having had a group of "pimples" on the left side of the bridge of the nose in 1910. In September of that year she was treated at the Philadelphia General Hospital for lupus erythematosus without improvement in seven months. After various treatments during the ensuing years, the condition finally disappeared, but recurred in the spring of 1925, spreading over both cheeks. Depigmentation resulted as the process became more widespread over the face. Recently the hands became involved. She has been under treatment at the University Hospital, receiving intravenous injections of gold and sodium thiosulphate, 100 mg. being given each week. A few injections have been given, but there has been no improvement. The patient was shown chiefly to illustrate the occurrence of the disease in the colored race and because of the palmar lesions.

DISCUSSION

DR. STRAUSS: Lupus erythematosus is rarely seen in the colored race, but at present I have had a full-blooded negro with this condition under my care. The results of treatment are unsatisfactory owing to the poor cosmetic result that follows even when a cure is obtained.

DR. WRIGHT: I think that the lesions on the hand have a peculiar appearance. They are hardly typical of lupus erythematosus, but look more like artificially produced lesions. Improvement after treatment with gold does not take place in some cases until a number of weeks or even months have elapsed, but eventually practically all patients are benefited or the eruption is cleared up. It must be kept in mind that gold in lupus erythematosus does not act with the rapidity of the arsphenamines in syphilis.

DR. STOKES: I suggest a properly tinted dye or paint to overcome the cosmetic difficulties.

DR. SIDLICK: In my experience injections of gold and sodium thiosulphate gave rise to reactions more frequently than did 4 amino-2 auro thiophenol carbonic acid.

DR. GREENBAUM: I feel that the gold preparations should be used exactly as other intravenous drugs—the patient's tolerance should be tested before the full dose is given, any reaction noted and the dosage regulated accordingly.

DR. HIRSCHLER: Are serious reactions apt to occur following the administration of the gold preparations?

DR. WRIGHT and DR. STOKES both reported instances in which death resulted from the administration of gold. In the case cited by Dr. Wright, gold had been administered to a patient with disseminated lupus erythematosus, and it seemed to hasten the end.

DR. GREENBAUM: I have seen the case referred to by Dr. Wright, and I feel that another factor was responsible for hastening the fatal issue.

SCHAMBERG'S PROGRESSIVE PIGMENTARY DERMATOSIS. Presented by DR. SIDLICK.

J. D. A., a white woman, aged 45, had noted patches on her legs for a number of years, which first involved the ankles and then spread until they extended above the knees. Clinically there were diffuse, irregular brown patches showing numerous punctate cayenne pepper spots at the periphery.

DISCUSSION

DR. DENGLER: I suggest the possibility of such patches arising as a result of a previous stasic eczema.

DR. SCHILDKRAUT: I believe that the diagnosis offered by Dr. Sidlick is correct.

DR. WRIGHT: Often a diagnosis of progressive pigmentary dermatosis is erroneously made when in reality the pigment on the legs is the result of an old stasic eczema. This case, however, presents the true characteristics of the condition as described by Dr. Schamberg in the *British Journal of Dermatology* in 1901. The color is an unusual brown, and at the periphery of the patches are seen the cayenne pepper spots which are of great significance in making the diagnosis.

DR. WEIDMAN: I do not think that there is enough induration present for an eczema. There are teleganiectases in the margins which are not found in eczema. This condition might be classed among the purpuras. In one case in which the eruption was more extensive than this, a question was raised concerning the correct diagnosis. After the birth of a baby, the patient became free from the condition, although it must be admitted that she received injections of a foreign protein. As to the diagnosis in the case before the society, I agree with Dr. Sidlick.

TUBERCULOUS ULCERS OF THE LEG. Presented by DR. WRIGHT.

A. M., a colored man, aged 30, presented three ulcerations over the inner surface of the right leg. These ulcers extended from the anterior malleolus up to just above the popliteal space. A considerable amount of cicatricial tissue separated and surrounded the ulcers. These were fairly deep, with irregular undermined borders, and the floor was clean. The patient said that they began when he was 12 years old, following a barb wound in the ankle. The condition had gradually extended up the leg. There was a considerable degree of pain, particularly at night. Results of examinations for parasites were negative. Inoculations with biopsy material from the border of one of the lesions gave positive results for tuberculosis in guinea-pigs. The pathologist reported "pigmented papillary nodule of the leg." There was no evidence of a tuberculous structure in this particular piece of tissue. Injections with gold and alpine lamp therapy were instituted.

DISCUSSION

DR. WEIDMAN: What were the observations in the guinea-pig? I suggest that a fungus infection be considered. Into what category of tuberculosis would this condition fall? It is probably closest to the lymphangitic form, though difficult to connect with any form.

DR. WRIGHT: Tubercle bacilli were found definitely in guinea-pigs. A number of cases of tuberculosis were seen which did not correspond to any described form. A puzzling case similar to the present one was shown previously to the society.

DR. STOKES: I think that other inoculations of guinea-pigs should be made.

UNILATERAL ALOPECIA. Presented by DR. KLAUDER.

N. C. V., a colored man, aged 30, had an alopecia limited to the right side of the head. There was no history of nerve injury and no unilateral sweating. Her only subjective complaint was that of tingling and numbness.

DISCUSSION

DR. STOKES: I consider this case one of trichotillomania, because of the facies, the character of the alopecia and the general conduct of the patient. The hair is long for a colored patient. I have seen a condition of alopecia of the same configuration posteriorly on an infant aged 14 months. This infant was just tested for the Schick reaction. Has any one observed a toxic alopecia following a Schick test?

DR. WEIDMAN: The condition is not unilateral in the anatomic sense, because the hair does not extend quite up to the midline.

PAPULONECROTIC TUBERCULID. Presented by DR. GREENBAUM.

F. M., aged 22, a white woman, first noticed a few small painful "sores" on the arms and legs six years before presentation. They first appeared as small hard lumps, which became larger and then ulcerated. They were worse during the winter. Injections of gold and sodium thiosulphate were begun in January, and by the time the third injection was given there was definite improvement; by the seventh injection, the lesions had practically disappeared. This was notable, considering that the improvement occurred during the season in which the condition was usually most severe.

DISCUSSION

DR. WEIDMAN: I suggest the diagnosis of erythema nodosum.

DR. SIDLICK: I should like to call attention to the fact that involution of any lesion of that type could not always be attributed to specific therapy, for the lesions might involute and then recur.

DR. DENGLER: I agree with Dr. Greenbaum.

DR. STRAUSS: I had a patient with a condition similar to this to whom I gave two doses of gold and a dose of neoarsphenamine following the two doses of gold. The neoarsphenamine caused about five times as much improvement as did the gold.

DR. WRIGHT: Injections of both neoarsphenamine and gold will fail at times. I have seen a patient with papulonecrotic tuberculid who was treated with six doses of neoarsphenamine and alpine light, and who at the end of six weeks had more lesions than in the beginning. At present, the patient is being given injections of gold with no results as yet. A patient of Dr. Wile's had lesions over the entire body and extremities, and in the throat there was definite tuberculosis of one tonsil. Within one week after removal of the tonsils, the entire cutaneous eruption had disappeared.

DR. STRAUSS: I believe that some kind of protein shock has to be obtained to cause a good result.

DR. STOKES: Treatment with the quartz lamp will make some patients a great deal worse. Neoarsphenamine will not cure all tuberculids. Often the diagnosis is wrong, and no one can say that tuberculosis is the basis of all tuberculids. I favor arsphenamine more than any other drug, and lesions

that do not show improvement under arsphenamine properly administered should be investigated from the standpoint of a focal infection. Neoarsphenamine will give dependable results also.

Dr. Hirschler: I had two patients with a condition similar to the one in this case. One was an adult who had nodes and ulceration on the back; the other was a definitely tuberculous child. The ultraviolet light did harm, but with the infra-red light there was decided improvement. The infra-red rays no doubt helped these lesions materially.

Dr. Greenbaum: The patient had received 800 mg. of gold. Two years ago she was treated with injections of neoarsphenamine and tuberculin, and the lesions disappeared.

Sarcoid of Boeck. Presented by Dr. Klauder.

Y. R. E., a white woman, aged 37, had reddish-purple macules the size of a split pea on both cheeks. There was a tendency to coalescence. The duration of the condition was about seven weeks.

DISCUSSION

Dr. Dengler: I suggest the diagnosis of tuberculid, or possibly a toxic reaction following ingestion of phenolphthalein.

Dr. Weidman: The eruption is too spotty for Boeck's sarcoid, which is more diffuse. From the slight scaliness and symmetry, I suggest lupus erythematosus.

Dr. Corson: I prefer the diagnosis of lupus erythematosus, because the condition is not sufficiently defined for sarcoid, and there is not enough infiltration.

Dr. Stokes: I think that the eruption is the edematous phase of acute erythematous lupus, though it might possibly be a sarcoid.

Dr. Greenbaum: There are two small patches on the left cheek which are typically lupus erythematosus.

Dr. Klauder: Though the condition lacks infiltration and is not defined, these characteristics are seen in advanced cases of Boeck's sarcoid, whereas the beginning may be similar to the eruption seen in this patient. In the case of widespread seborrheic dermatitis in a colored girl, aged 6, presented at the last meeting, the lesions disappeared a week after the injection of 3 per cent salicylic acid and ammoniated mercury.

Telangiectasis of Unknown Origin. Presented by Dr. Strauss for Dr. Brown.

H. K. L., a white woman, aged 47, had a facial telangiectasia of two months' duration. There was no history of roentgen-ray treatment except that four years before some sort of a lamp was used for treatment of the "pimples."

DISCUSSION

Dr. Dengler: I had a case of acne in which the patient was treated with a series of roentgen-ray exposures of 0.25 skin unit, fourteen doses at weekly intervals. Would it be safe to give another series of treatments a year later?

Dr. Stokes: I have never given more than that amount, and I believe that ten doses of one-fourth skin unit would be sufficient. The patient before the society is a good example of the result of too much roentgen-ray treatment.

A Case for Diagnosis. Presented by Dr. Greenbaum.

Mrs. R. W., white, aged 35, developed an eruption in October, 1926, at that time having only a few flat oval erythematous lesions on the right thigh. Three or four weeks later, numerous lesions appeared over the body, accompanied by a marked pruritus. New lesions continued to appear. Examination revealed a fairly widespread eruption over the body and thighs, which consisted of irregular oval lesions varying in size from that of a pea to that of a large orange, having slightly elevated, red, scaly borders and faintly erythematous, slightly scaly centers. The eruption had the appearance of an atypical pityriasis rosea. The results of smear examinations of scales for fungi were repeatedly negative. The Wassermann reaction was negative, but the Kahn reaction was slightly positive. The eruption had been unchanged during the past few weeks before presentation.

DISCUSSION

Dr. Corson: I think that without itching and without scale, this condition is definitely suggestive of fungus infection.

Dr. Greenbaum: Results of repeated fungus examinations were negative.

Dr. Stokes: There are chronic types of erythema multiforme between that and a dermatitis herpetiformis. The lesions are not definitely pruritic at times, but they will become highly pruritic and circinate as these are. I have seen a case of this kind in which the eruption went through an extraordinary cycle of changes, and in which many of the lesions were identical with these.

Dr. Greenbaum: Ringworm and parapsoriasis can be ruled out because of the response of these lesions to the roentgen rays. The roentgen rays have little, if any, effect on a fungus infection or a parapsoriasis. The lesions in this case suggest pityriasis rosea, but might possibly be those of an atypical erythema multiforme or a premycotic stage of mycosis fungoides.

Dr. Sidlick: The lesions are not infiltrated. They apparently begin as superficial patches and spread peripherally. That would speak against the diagnosis of mycosis fungoides.

Dr. Weidman: The eruption looks like a dermatomycosis, and I advise that examinations for fungus should not be limited to a search for *Hyphomycetes*. At a recent French symposium, it was brought out that yeast cells may produce dermatoses like those caused by *Hyphomycetes*. The eruption does not seem sufficiently erythematous for a premycotic stage of mycosis fungoides.

Dr. Greenbaum: Beta-naphthol and salicylic acid were used locally and did not help. Premycotic lesions are extremely variable and are not necessarily infiltrated or erythematous.

Dr. Stokes: The possibility of this eruption being a mycosis fungoides should be kept in mind. I suggest that a biopsy be made.

Alopecia Areata Totalis. Presented by Dr. Klauder.

T. Y., aged 8, was treated for total alopecia with the alpine light at the Philadelphia General Hospital. He now has a full growth of hair, but the condition is recurring as a single patch in the occipital region.

Morphea in a Colored Man. Presented by Dr. Corson.

S. M., a colored man, aged 20, noticed an eruption on the scalp three years before presentation. It spread downward to the cheeks and nose. The patient says the lesions were hard and indurated originally, and are now softer like an atrophic scar. At present the lesions are depressed, atrophic and pigmented.

DISCUSSION

DR. WEIDMAN: The marked uniform atrophy eliminates the diagnosis of a postzosteric condition. Diagnosis is difficult in view of the race of the patient.

DR. CORSON: There was no history of trauma.

DR. WRIGHT: Has any one seen pigmentation in a colored person instead of depigmentation as would be expected?

MANHATTAN DERMATOLOGICAL SOCIETY

March 8, 1927

J. J. ELLER, M.D., *Chairman*

ULERYTHEMA OPHRYOGENES. Presented by DR. ROSEN.

The mother of E. F., aged 4, said that at the age of 1 year she had noticed an unusual redness of the eyebrows, forehead, cheeks and ears. This was followed by small follicular elevations in these areas and on the extensor surfaces of the arms and thighs. At the age of 2, the child developed lentil-sized, brownish-red lesions under the chin and on the inner surface of the right arm above the elbow, which were diagnosed as tuberculosis of the skin (the father was suffering from an active pulmonary tuberculosis at the time). These lupus vulgaris lesions were treated with pyrogallic acid and had entirely healed, leaving small depressed scars.

DISCUSSION

DR. MACKEE: I agree with Dr. Rosen's diagnosis. This is a typical but unusually extensive case of ulerythema ophryogenes. Usually we see this disease limited to the outer portions of the eyebrows. In this instance the entire areas of the eyebrow are involved. It is the first time that I have seen the erythema type of keratosis pilaris on the face, especially associated with erythema ophryogenes. I have seen the association of the two diseases, with the keratosis pilaris on the arms or legs but not on the face. The conditions are similar both histologically and pathologically.

DR. OULMANN: The question of the possibility of an endocrine disturbance was brought up. I believe the endocrine function is faulty in this case.

DR. ROSEN: The follicular eruption has never disappeared, although from time to time a slight improvement has been noted under the various forms of treatment instituted. Recently the eruption has shown a tendency to spread more on the cheeks and upper lip as well as on the trunk. Associated with this condition is the unusual appearance of the child's hair, which was coarse, dry and tightly curled, resembling that found in the colored race. Under the microscope the individual hairs were normal. The general health of the boy is good, and he is precocious mentally.

TUBERCLE OF MIBELLI. Presented by DR. PAROUNAGIAN.

Mrs. M., aged 23, was referred to the syphilitic clinic of Bellevue Hospital by an ophthalmologist for the treatment of interstitial keratitis of the right eye. While under treatment, her left eye became involved also. Her Wassermann reaction was four plus. She manifested a number of stigmas belonging

to her condition, namely, a high vault, tubercle of Mibelli on the upper left first molar, an irregular and imperfect hair line and a protruding forehead. Recently she was accompanied by her 5 year old boy, and an examination of the child was made. He also showed a marked example of tubercle of Mibelli on both upper molars, a high palate and an imperfect hair line. His Wassermann reaction was negative.

DISCUSSION

DR. SATENSTEIN: I do not accept Dr. Parounagian's statement regarding the high palate arch in this case. I do not think it is particularly high, nor does it signify anything specific. The development of the jaws, the bite, the presence of adenoids or enlarged tonsils are all important factors which have to be taken into consideration when considering a high palate arch.

DR. OULMANN: Ever since Dr. Parounagian brought up his syndrome, I examined all my cases of hereditary syphilis for tubercle of Mibelli, and I found about the same number showing this abnormality as I found without it.

DR. LEVIN: Tubercles similar to those presented by Dr. Parounagian's patients may be found in children who have no evidence of syphilis.

DR. WISE: The demonstration here of both mother and child with the tubercle of Mibelli is rather convincing evidence of the association of the dental defect with congenital syphilis. It would be of value to get statistics of the occurrence of these dental tubercles in patients who have no signs or symptoms of syphilis.

DR. MACKEE: I can think of no way to prove definitely the relationship of tubercle of Mibelli to ancestral syphilis. Ancestral syphilis has been blamed for all sorts of conditions. Many conditions are thought to be due to the effect of syphilis on the endocrines of the immediate and even of the remote ancestors. There is, however, no definite truth that hereditary syphilis is to blame for all these various conditions, such as insanity, peculiar personality, endocrine abnormalities, peculiar stature, alopecia, birthmarks and other characteristics. As a matter of fact, at the present time it is impossible to prove definitely whether some living persons have or have not syphilis. Naturally it is much more difficult to obtain satisfactory proof in the case of our ancestors. The tubercle of Mibelli is a defect. That it is due to syphilis, may well be doubted. In any event, it will require years of observation to decide this question. I thank Dr. Parounagian for presenting so many cases. At least, I now have a better clinical conception of this defect than I had before.

I agree with Dr. Satenstein concerning the question of a narrow or vaulted hard palate. An exceedingly common cause for this condition is mal occlusion of the teeth followed by faulty development of the jaw bones. This mal occlusion is usually due to mouth breathing and, of course, is often secondary to adenoids. If detected early, this condition can be entirely corrected by removal of adenoids and large tonsils and proper treatment by an orthodontist. We should be careful about accepting a narrow dental arch as an indication of hereditary syphilis.

DR. PAROUNAGIAN: I have been watching these cases closely for a number of years and have been keeping a record of them, and I could not resist the temptation to show this patient. The diagnosis of interstitial keratitis was made by a well known oculist. The patient had a four plus Wassermann reaction and gave a history of her father having had syphilis. She shows syphilitic stigmas, and the child aged 5 shows the same stigma. It is natural to presume that these are a sign of congenital syphilis. I have seen a number

of instances wherein a patient had congenital syphilis but did not have hutchinsonian teeth. A positive Wassermann reaction is not necessary in order to make a diagnosis of congenital syphilis.

Dr. Satenstein sent me an article in which this condition was described by a Viennese dentist in 1843, and he believed it a sign of congenital syphilis. Jeanselme of Paris thinks it is a sign of congenital syphilis.

A Case for Diagnosis (Neurodermatitis). Presented by Dr. Parounagian.

Miss O., aged 19, had a generalized itching eruption which had been present since the age of 1, for which she had received treatment from several well known dermatologists and in clinics, without much relief. The lesions consisted of scaly, infiltrated, eczematous patches. The general integument was rather brownish red and dry. Itching was so intense that the patient was unable to sleep. She was obliged to give up her position as a clerk. Her blood count and urine were normal. She had had roentgen-ray treatment (eight applications in all) and various ointments, such as lotions and thyroid extract.

DISCUSSION

Dr. Scheer: Some of these cases show that the condition commenced in early childhood and lasted many years. I think this is a generalized neurodermatitis.

Dr. Oulmann: I regard this case as an allergic dermatitis. As this patient's condition gets worse in the fall, I think the different ragweed tests ought to be made, besides the other protein tests.

Dr. Levin: I do not see how a diagnosis of seborrheic eczema could be made on the basis of the lesions presented by this patient. This case impressed me as being one of neurodermatitis. This could well start early in childhood and continue through life with recurrences. I would like to call attention to the frequent association of vagotonia with neurodermatitis. Good results are obtained in some cases by the use of belladonna and atropine internally.

Dr. Wise: I agree with the diagnosis of neurodermatitis made by Dr. Oulmann, probably due to anaphylaxis. There are dermatologists who would call this eruption eczema. There are some patches on the body that look like seborrheic eczema. It is a question whether the lichenification is primary or secondary. I think it is secondary to a seborrheic eczema.

Dr. Kingsbury: I think observation in this case along the line suggested by Dr. Oulmann is indicated and desirable.

Dr. MacKee: I think that this is a case of generalized neurodermatitis. Years ago this would have been called lichenified eczema. It is now considered an entity. It is distressingly pruritic, tremendously recalcitrant and shows predilection for the flexures and flexor surfaces. It is often associated with hayfever and asthma and may be a sensitization disease. The best results are obtained with the roentgen ray, ultraviolet rays, anaphylactic shock, topical remedies and rest.

Dr. Satenstein: I think all those who took part in the discussion said that the patient did much better during the summer. Whether that is due to the action of the sun's rays or to the out-door life and stopping of all medication, was not discussed. Recently a child, aged 6 years, with a generalized neurodermatitis was treated with the ultraviolet light. When a good reaction was obtained, the condition improved very much, remaining better for some weeks or months.

DR. WISE: I recall two patients who were benefited by the injection of bromide. Several men I have spoken to said they obtained the same results by giving bromide by mouth, and said that it was absorbed as readily from the stomach and intestines, but I have not found that to be the case. In the patients given bromide by mouth I did not obtain the same results as I did in those to whom it was administered intravenously.

DR. LEVIN: Regarding the injections of bromide, at times the itching and nervous symptoms seem to be relieved by the intravenous use of bromide.

DR. SATENSTEIN: In reference to treatment with injections of whole blood, definite results will not be noted until after the eighth injection.

DR. LEVIN: In regard to autohemotherapy, it seems to help some.

DR. SATENSTEIN: To what can a child of 1 year be sensitive? Sugar in some form or other. Children being fed with maltose dextrose occasionally develop an intensely itchy papular eruption. By substituting a small quantity of lactose, the condition clears up without any local therapy.

DR. PAROUNAGIAN: I am grateful for the discussion of this case. I saw this patient about two months ago, and the mother at that time said the condition commenced at the age of 1. I do not know what the child could be sensitive to at that age, and she had been treated for over three years by the late Dr. Trimble. She had had many prescription, and roentgen-ray applications. She is better today than she has been since I saw her for the first time. She remains in bed to keep warm in order to avoid itching. Her face has practically cleared up now. I have been giving her treatments with ultraviolet light two times a week; lately I have given her injections of peptone, which in my opinion are helping her.

ALOPECIA UNIVERSALIS. Presented by DR. ANDREWS.

H. C., a boy, aged 9, had a good growth of hair on the scalp until four years before presentation, when it suddenly fell out; the eyebrows fell out also. The patient presented tubercles of Mibelli on the upper molars and no lanugo hair. There was no history of consanguineous marriages; the patient's grandmother had eight children, and his mother had three healthy children and no miscarriages. A Wassermann test was taken, but the result has not been reported.

DERMATITIS HERPETIFORMIS (?). Presented by DR. ELLER.

R. S., a man, aged 70, had suffered for the past eight years from recurrent attacks of grouped vesicles and bullous lesions on the skin and mucous membranes of the mouth. The latter area had been free from lesions for the past three years. On examination, numerous groups of vesicles and bullous lesions were present on the extremities and trunk, many of the bullous lesions being on what was apparently normal skin. The patient explained that the vesicles appeared suddenly on normal skin and that a severe pruritus followed. His mouth had been free from lesions. The entire surface of the body had been given erythema doses of infraroentgen radiation. The number of vesicles and bullae had decreased considerably, and the patient had been gaining weight. The pruritus, which had been marked, had entirely disappeared.

A diagnosis of pemphigus had been considered, but the grouping of the lesions, with pigmentation on former sites, the itching, the chronicity and the absence of Nikolsky's sign, made the presenter favor the diagnosis of Duhring's disease.

DISCUSSION

DR. MACKEE: I agree with the diagnosis of dermatitis herpetiformis because of the long duration, the patient's good general health, the intense itching, the pigmentation and grouping. There are patches of erythema containing numerous vesicles and bullae. On the other hand, bullae appeared on the unaltered skin, and the patient said that there had been doubtful lesions in the mouth. I believe that there is such a thing as chronic benign pemphigus, but in this case I would favor a diagnosis of dermatitis herpetiformis.

DR. KINGSBURY: I agree with the diagnosis.

DR. WISE: I agree with Dr. MacKee. The main point which leads me to the diagnosis of Duhring's disease is the presence of widespread edematous plaques on the back in which the vesicular lesions appear. That is not characteristic of pemphigus.

DR. LEVIN: I agree with Dr. MacKee and Dr. Wise in that the condition is not pemphigus. I think that it is the bullous type of erythema multiforme. Although the patient presented lesions that seemed to come out of the apparently normal skin, the great majority of the lesions were of the multiforme type with macules, papules, vesicles and a tendency to crescentic configuration and grouping with pigmentation and pruritus, all of which did not conform to the diagnosis of pemphigus. The entire picture was suggestive of bullous erythema. The Nikolsky sign was absent.

DR. SATENSTEIN: I recall a similar case which had been under the observation of the late Dr. Gottheil for a number of years. At first it was called dermatitis herpetiformis, but later it was labeled chronic erythema multiforme in a diabetic patient. When the patient's diabetic condition was improved and the urine was free from sugar, the skin condition would clear up almost entirely. I suggest that possibility here, but the evidence points to dermatitis herpetiformis.

PHENOLPHTHALEIN DERMATITIS IN A COLORED PATIENT. Presented by DR. OULMANN.

A colored man, aged 35, came to the clinic about four weeks before presentation with bullous lesions in the mouth. The skin at that time was free from lesions. The possibility of pemphigus had to be taken into consideration. When he appeared a week later, the bullous lesions had almost cleared up, and there were a number of pigmented annular lesions on the arms, back and the sacral region. The patient gave a history of taking fenamints and was, therefore, presented as having a case of phenolphthalein dermatitis.

DISCUSSION

DR. SATENSTEIN: This is the first case I have seen in a colored person.

DR. MACKEE: This is the first time that I have seen a phenolphthalein eruption on a very dark skin. It is also the first case of phenolphthalein eruption that I have seen occurring in the mouth. Dr. Oulmann is to be congratulated for making the diagnosis when there were no lesions on the body. Lesions in the mouth are difficult to diagnose, especially when they cannot be regarded as some definite entity, such as leukoplakia, lichen planus and lupus erythematosus, and when they are unassociated with skin lesions. In such instances it is necessary to consider drug eruptions, idiosyncrasy to chemicals in mouth washes, powders, pastes and many other possibilities.

DR. OULMANN: When the lesions were young, they showed a bluish center with a red ring. On the brown skin this was a striking picture. I have seen four cases of this same condition during the last four weeks, all caused by the same preparation.

CHANCRE OF THE TONSIL. Presented by DR. PAROUNAGIAN.

H. J., aged 29, an American negro, was referred from the third surgical division of Bellevue Hospital, the day previous to presentation. He denied previous venereal infection. His present ailment had begun about six weeks before presentation, with sore throat and swelling of the lymphatics at the angle of the jaw on the right side. The rash appeared about one week before presentation. Examination disclosed the following: marked swelling of the glands at the angle of the jaw on the right side which could be detected at a distance; a discrete papular eruption noted on the face and about the body; no evidence of chancre on the genitals, except a few secondary lesions similar to the ones on the body; marked general adenopathy. Prior to his visit to the clinic, he had been treated at some clinic by local applications to the throat. Dark-field examination was negative. The result of the Wassermann examination had not been reported.

ST. LOUIS DERMATOLOGICAL SOCIETY

March 9, 1927

ROBERT H. DAVIS, M.D., *Presiding*

DERMATITIS EXFOLIATIVA WITH ALOPECIA COMPLICATING ARTHRITIS DEFORMANS. Presented by DR. JOSEPH GRINDON.

A white woman, aged 38, married, the mother of three healthy children, had had arthritis for the last three years. The tonsils and some teeth had been removed without appreciable benefit. One year before presentation the quartz lamp was used, producing a second degree reaction. Last July the face became swollen and dark red, and the patient had a high fever which lasted for three or four days (erysipelas?). Since that time she had had an exfoliative dermatitis of the face. In September she had lost all hair on the scalp except a narrow nuchal fringe. Since then a regrowth of thin fine hair had appeared over the middle third of the scalp, anteroposteriorly. Two months before presentation the dermatitis began to spread from the face until it involved the whole surface continuously to the hips, the hands being the least affected. The lower extremities showed scratch marks. There was a boil in the left axilla. The patient complained of constant thirst and chilliness.

The first observation of the patient was made at presentation before the clinic. She had received a number of intravenous injections believed to have been sodium salicylate and sodium iodide.

LICHEN PLANUS (INCIPIENT). Presented by DR. JOSEPH GRINDON.

A white man, aged 44, weighing 240 pounds (108.8 Kg.), a waiter, gave a negative family history. Urinalysis showed no sugar or albumin. About February 1, the skin condition began on the outer aspect of the right leg, from

which it gradually scattered to the whole surface with the exception of the scalp and face. On February 17 at the site of the original lesion on the leg, an oozing and crusting patch the size of a hand was observed. Nearby were numerous similar coin-sized patches, while others were scattered over the general surface. There were also numerous minute papules and papulovesicles situated at follicular orifices, generally distributed. All lesions were intensely pruritic. A week later most of the lesions were paler, dryer and less pruritic except the large patch on the leg in which the condition had become more acute. Two weeks later the moisture disappeared, and the lesions at most sites had taken on the appearance characteristic of lichen planus. There was a faint papule on the glans penis; also an opaque white patch on the buccal mucosa.

DISCUSSION

DR. CONRAD: I agree with the diagnosis of generalized lichen planus.

DR. TOBIAS: This diagnosis did not occur to me until I looked into the mouth and saw the characteristic patches. There are atypical patches of papules on the arms. Sometimes one sees lesions like this in patients who scratch and rub the skin a great deal, causing the formation of lichenified areas.

DR. GRINDON: I presented this case because at first there were only eczema-like papules and vesicles. A week later, I thought of the possibility of its being lichen planus. At the third observation a number of the lesions had become typical planus lesions, confirmed by lesions on the glans and buccal mucosa. It is well to bear in mind that planus does not always look like planus.

A CASE FOR DIAGNOSIS. Presented by DR. ERICH BROCKELMANN.

Mrs. L. O., a white woman, aged 44, had been operated on for a fibroid tumor of the uterus seven weeks before presentation. About two months previously she had noticed a small pimple on the right side of the head which had grown rapidly during the past two weeks, had softened and begun to bleed. At presentation a single round papillomatous growth the size of a cherry was observed over the right parietal region. The rapidly growing tumor was soft, highly vascularized and showed irregular nodulations on its surface. The overlying epidermis was shiny and smooth and of a purple to black color. The patient also had a hard dark red mole the size of a pea which had been on the top of her head for many years.

DISCUSSION

DR. SHOWMAN: I think that this is a case of granuloma pyogenicum.

DR. BROCKELMANN: This is not a typical case. The lesion is externally flat.

DR. GRINDON: Dr. Brockelmann speaks of "typical" granuloma pyogenicum. Some lesions are pedunculated; others are sessile with a collar at the base. As to softness, that is characteristic of granuloma pyogenicum.

DERMATITIS MEDICAMENTOSA (TENTATIVE DIAGNOSIS). Presented by DR. R. H. DAVIS.

A man, aged 24, seven weeks before presentation had a genitocural infection which was followed by orchitis. He was given bromides to prevent painful nocturnal erections. The dosage prescribed failing in effect, he increased it without medical advice, obtaining some relief. Two days before this medication was abandoned, the present eruption appeared (ten days before presentation). This was six weeks after the infection had occurred.

At presentation, a discrete, confluent, dusky, maculopapular eruption was noted on the cheeks, neck, backs of the hands, wrists and thighs. The eruption also occurred on the body and below the knees, although sparsely. On the thighs there was a tendency to grouping of the lesions. The individual lesions were macules; some of them were maculopapules. The lips and throat showed redness and some whitish areas. The pulse rate was 95 and the temperature 98.6. There was some epitrochlear and inguinal adenopathy. The eruption was intensely pruritic at first, but the pruritus has subsided. The scaliness in places was probably due to a salve which the patient had used. There has been no opportunity to make a Wassermann test.

DISCUSSION

DR. BROCKELMANN: I think the condition is dermatitis from external application on top of a dermatitis medicamentosa.

DR. SHOWMAN: I agree with Dr. Brockelmann's diagnosis.

DR. GRINDON: I concur in Dr. Davis' tentative diagnosis. We do not know what the man has been taking except that the medicine contained bromide. The lesions somewhat resemble those from chloral hydrate, nowadays rarely used.

DR. TOBIAS: This condition is not typical of bromide eruption because of the diffuse dermatitis over the face and forearms which might be due to local applications. Otherwise the history of the onset, together with the picture on the dorsum of the trunk, makes one suspicious of a dermatitis medicamentosa.

DR. CONRAD: I think it is dermatitis medicamentosa. As to just what the drug was, we do not know. The patient gives a history of a bromide, but it might have been a mixture.

DR. TOBIAS: The patient had an orchitis. Sodium iodide is often given intravenously for this condition.

DR. DAVIS: The diagnosis I offered was dermatitis medicamentosa, but I had never seen a bromide eruption that looked like the one in this case. The man is an intelligent fellow and gave a clear account of what he had taken. The only internal medication he has taken is a sedative which he understood to be a bromide, and which he kept on increasing far beyond the amount that the physician treating him had prescribed. I know that the eruption on the hands and face has been changed in appearance from some local application. The scales on the hands appeared only after the application of the salve. I do not know what was in the salve. We referred him for a Wassermann test and had hoped to have the report for this meeting. We do not consider the condition syphilis, however.

A CASE FOR DIAGNOSIS. Presented by DR. E. R. SEALE. (From Barnard Free Skin and Cancer Hospital, service of Drs. M. F. Engman and W. H. Mook.)

F. L., a white boy, aged 11, presented lesions of one month's duration located on each knee, exactly bilaterally symmetrical. On the anterior surface of the left knee there was a raised, flat-topped lesion the size of a small almond. It was pink, slightly tinged with orange, and the surface was divided by numerous crypts which gave it a cauliflower-like appearance. Around this and on the right knee were isolated orange-colored papules the size of a pinhead, with centrally depressed surfaces.

DISCUSSION

DR. CONRAD: Looking at the lesion from a distance, one would think of molluscum, but after puncturing and not finding any molluscum bodies, I think

that that diagnosis can be ruled out. If it is lymphangioma circumscriptum multiplex, the examination disclosed no oozing which we usually find frequently with the needle. I do not wish to offer any diagnosis at this time.

DR. TOBIAS: A biopsy should determine the diagnosis.

DR. CONRAD: I should like to add that in the clinic the other day several of the lesions were scraped out with a knife but did not disappear.

DR. GRINDON: One group, the larger patch on the left knee, showed distinct umbilications.

DR. DAVIS: To me the condition looks more like molluscum than lymphangioma.

DR. GRINDON: The little network of fine vessels around the individual vesicles is lacking; also the translucence.

DR. SEALE: Treatment in the hospital consisted of incising lesions to get fluid.

GRANULOMA INGUINALE TROPICUM. Presented by DR. ERICH BROCKELMANN.

A colored man, aged 27, gave a history of a bleb on the dorsum of the shaft of the penis two and a half years prior to presentation. The blister ruptured shortly after its appearance, and a clear fluid exuded. The lesion increased to the size of a dollar. The ulceration was covered with succulent discharge which dried up and formed crusts. One month after the appearance of the lesion, a similar one started on the glans penis. Since that time the growth has been slow. Pain was not present. Three years before the inguinal buboes were incised. The patient said that he had not had syphilis or genitocural infection. His family history was not relevant. The results from a Wassermann test are to be reported later. The patient presented several linear ulcers in the genitocural region with wartlike raised borders.

DISCUSSION

DR. GRINDON: I agree with the diagnosis, although the border is made up of distinct nodules of about equal size, and is not like the picture seen in granuloma inguinale tropicum.

A CASE FOR DIAGNOSIS. Presented by DR. E. R. SEALE. (From Barnard Free Skin and Cancer Hospital, service of Drs. M. F. Engman and W. H. Mook.)

M. M., a white man, aged 26, presented two active lesions and a scar formation from a previous lesion on the inner posteromedial aspect of the upper part of the left thigh. The condition began one year before presentation. The two ulcerations were similar in character. The uppermost was 2 cm. in diameter; the lower was about twice the size of a silver dollar. They were characterized by a punched-out central portion with edges slightly raised and indurated, and had a ragged and worm-eaten appearance. The patient's history was positive for syphilis. He had received ample antisyphilitic treatment within the past sixteen months, from the time the primary penile lesion was noted. The ulcerations, however, had not healed. Although the Wassermann reaction was negative, the patient had had the therapeutic test.

DISCUSSION

DR. GREINER: I think it is a case of serpiginous syphiloderm.

DR. TOBIAS: This is a serpiginous late syphilitic eruption.

DR. GRINDON: The upper patch to the left is distinctly serpiginous with a large scar below and an active lesion with a rat-gnawed border leading away from it. The nodules at the border are so hard that in spite of the fact that the man is only 26 years of age, I am inclined to make a provisional diagnosis of carcinomatous degeneration of a syphilitic lesion. It might be called "galloping syphilis."

DR. DAVIS: In the gynecological clinic some time ago we had a case of a syphilitic lesion of the vulva, probably a gumma, with carcinoma developing on it. Dr. Fred J. Taussig said that the prognosis for such lesions was bad. I am wondering whether that might be true in this case.

EROSIO INTERDIGITALIS. Presented by DR. R. H. DAVIS for DR. G. V. STRYKER.

Mrs. Y. L. presented herself at the clinic in October, 1926, with lesions on the interdigital spaces, which had been present for several months. These lesions had a shining red base, a rim of white epidermis and were located on the third and fourth interspaces of both hands. They were pruritic. Scales were secured and planted on Sabouraud's solid medium. The colonies grew out in almost pure culture. Smears from these colonies showed yeastlike oval and round cells with an occasional elongated cell or mycelial cell. Budding was present.

Further examination and culturing at the Department of Bacteriology of St. Louis University School of Medicine revealed hyphae, articular clusters of conidia and budding cells but no ascospores. These facts, together with the reactions in sugars led us to classify this organism, according to Castellani, in the genus *Monilia*. Studies of the negative cultures of the skin scrapings of the interdigital spaces of twenty-five normal persons lead me to believe that we are dealing with a definite infection in these cases and not with a contaminant of normal skin or a failure of technic (G. V. Stryker).

DISCUSSION

DR. TOBIAS: I do not think that race has anything to do with this condition except so far as the use of soap is concerned — (soap is not used by the orthodox Jewish women in washing dishes; they use washing powders). I have never seen a case of erosio interdigitalis in a man of this race.

DR. GRINDON: Dr. Stryker has shown that the condition is not blastomycetic. Since he is not present without offending his sense of modesty we can remark on the fine piece of investigative work he has done in these cases. If we learn the definite cause, thanks will be due to his efforts.

BLASTOMYCOSIS. Presented by DR. ERICH BROCKELMANN.

A colored laborer, aged 37, gave a negative family history. In 1916, he had a chancre and was treated for syphilis; otherwise he had been healthy. Two years before presentation he was employed in the stockyards; one year before on the railroad, and more recently, in a steel foundry. About two months and a half before presentation, he noticed a small, wartlike growth on the right temporal region. Shortly afterward other lesions appeared on the neck, chest, elbow, hand, foot and back, which rapidly increased in size, ulcerated, and produced a brownish, foul-smelling discharge which dried, forming brownish crusts. The subjective symptoms consisted of slight pruritus and occasional stinging, but no pain. The lesion on the forehead had been excised by a physician. This procedure seemed to accelerate the growth. A four plus Wassermann reaction was

obtained. The newer lesions were of the size of a hazelnut and of a carbunculoid character, soft and deeply embedded in the skin. The older lesions were round or oval, the size of the palm or larger, showing an atrophic, brownish-white scar in the center, which was surrounded by granular ulcerations with raised papillary borders and dirty-looking crusts. The smears and biopsy reports were positive for blastomycosis.

DISCUSSION

DR. GREINER: Judging from the history, I think it is a rapidly developing case of blastomycosis.

TOXIC ERYTHEMA. Presented by DR. E. R. SEALE. (From the Barnard Free Skin and Cancer Hospital, service of Drs. M. F. Engman and W. H. Mook.)

P. B., a white woman, aged 30, had been presented at the November meeting of this Society, at which time a diagnosis of toxic erythema due to ovarian hypofunction was agreed on, based on the fact that the lesions had disappeared with the administration of corpus luteum. All therapy was discontinued after this, and the patient remained free from the eruption for three months; she then had a recurrence, the condition for the second time disappearing under corpus luteum therapy.

DISCUSSION

DR. SEALE: This case was interesting to me in that the condition disappeared or improved when the corpus luteum was most active, and became worse as its secretion was diminished. As you know, the corpus luteum develops at the site of the ruptured Graafian follicle about twelve days after menstruation, and degenerates just before menstruation, at which time the eruption became aggravated. Of course during pregnancy it persists as the true corpus luteum and is thought to control the growth and nutrition of the uterus, as when it ruptures abortion occurs. As the patient remained free from the eruption when the secretion of corpus luteum was at its height, as this is the principal secretion of the ovaries, and as the eruption cleared up under its administration, I think this strongly suggests that the condition was caused by ovarian hypofunction.

NORMAN TOBIAS, M.D., Missouri Bldg.

DETROIT DERMATOLOGICAL SOCIETY

Regular Meeting, March 15, 1927

H. S. BARTHOLOMEW, M.D., *Presiding*

FIBROSARCOMA. Presented by DR. JAMIESON.

W. P., aged 38, proprietor of a restaurant, had noticed a small mass in the right cheek ten years previously; it enlarged, was opened, and a serous fluid was drained. Other masses appeared on the forehead and enlarged; they recurred after excision on two occasions. At the time of presentation there were firm, nodular masses surrounding the scar left by the excisions, and a smaller erythematous, fluctuating tumor at the border of the scalp. The surface of the nodules was telangiectatic. The pathologist reported it to be "a non-encapsulated cellular fibroma, sugestive of fibrosarcoma."

DISCUSSION

DR. STEVENS: I would suggest electrocoagulation as a more effective treatment than irradiation.

DR. WILE: Histologically, the tumors look malignant. They tend to recur locally, but are relatively benign.

A CASE FOR DIAGNOSIS. Presented by Dr. Shaffer.

F. J., aged 43, a truck driver, in good general health, had had recurrent destructive ulcers on the trunk, arms, face and neck since 1914. There were numerous thickened scars in the affected areas, and a few active lesions, from one quarter of an inch to three inches (0.63 to 7.6 cm.) in diameter, markedly infiltrated. The Wassermann reaction was negative. There had been some improvement under antisyphilitic treatment and exposure to the quartz lamp.

ERYTHEMA MULTIFORME (IRIS TYPE). Presented by DR. SCHILLER, DR. PERKINS and DR. SCHLEGELMILCH.

J. G., a man, aged 22, had been seen first twelve days previously with two circular maculopapular lesions on the palm and dorsum of the right hand. The lesions were violaceous, with central fading. As presented, the case also showed lesions on the thumb and index finger, of the same iris type. There were three circular erosions in the mucosa of the left cheek. The tonsils and pharynx were infected. The Wassermann reaction was negative.

DISCUSSION

DR. WILE: I recently saw a case of multiform erythema following the ingestion of copaiba in which the palms and soles were involved.

SMALL ANNULAR SYPHILID. Presented by DR. TROXELL.

T. B., a colored boy, aged 16, had had a preputial sore six weeks previously, followed by a generalized papular eruption. The papules had a decided tendency to flatten centrally; some of them had a vesicular aspect. The patient felt well and had had no treatment.

DISCUSSION

DR. BIDDLE: These lesions often occur in negroes.

DR. WILE: The lesions are unusually small. Those described by Fox and others were not early secondary lesions, and were larger. This looks like an earlier syphilid, and if the patient is not treated there may be an enlargement of the lesions.

DERMATITIS EXFOLIATIVA IN A NEGRO. Presented by DR. SCHILLER, DR. PERKINS and DR. SCHLEGELMILCH.

N. Y., a colored man, aged 60, had first noticed pruritus of the chest three months previously. After scratching, a dry scaling eruption appeared and soon became generalized. The itching was constantly intense. There was a generalized exfoliative dermatitis with thickening of the skin. The patient had taken powders of some kind before the appearance of the eruption, and had since had several injections of an arsenical preparation without apparent benefit. The Wassermann reaction was negative and the blood count was normal.

DISCUSSION

DR. JAMIESON: I saw the patient six weeks ago, and could make no definite diagnosis.

DR. WILE: I have never before seen exfoliative dermatitis in a negro.

PARAKERATOSIS VARIEGATA (?) Presented by DR. SHAFFER.

A blacksmith, aged 65, had had a dermatitis of twelve years' duration, which began on the legs and slowly became generalized. There was severe pruritus. There had been occasional remissions. Local treatment had been of little value. The eruption consisted of large erythematous macules, with normal skin between them. Senile keratoses and epitheliomas also were present.

DISCUSSION

DR. BIDDLE: The long duration without tumors and the appearance of the lessions would seem to exclude the possibility of mycosis fungoides.

DR. WILE: There is distinct relationship between some cases of parapsoriasis in plaques and granuloma fungoides. The eruption may begin to itch, and later become granuloma fungoides. It is well to look for granuloma fungoides when itching begins.

LUPUS ERYTHEMATOSUS. Presented by DR. PERKINS.

O. G., aged 32, a truck driver, had first noticed small, sharply outlined patches on the nose and checks seven or eight years previously. As presented, the erythematous patches had the characteristic distribution and appearance of lupus erythematosus. Behind the right ear there were several small deeply punched-out scars, and inside the ear there was a similar appearance, together with some comedo-like follicular plugs.

DISCUSSION

DR. PARKHURST: The peculiar lesions in the ear and behind it were apparently the result of lupus erythematosus rather than an old acne.

BURNING TONGUE. Presented by DR. WANDER.

Mrs. C. R., aged 62, had had burning sensations in the tongue for five years, since she had had an upper dental plate. Her general health was good. The tongue was of the scrotal type, dusky red and apparently swollen. There were pigmented atrophic areas on the mucosae of both cheeks.

A CASE FOR DIAGNOSIS. Presented by DR. VALADE.

E. M., a woman, aged 64, born in England, had first noticed an eruption on the lower extremities about four months previously; the trunk had been involved subsequently. She complained of itching and burning. When first seen, she had presented a generalized erythematous dermatitis. On both lower extremities, in addition to the erythema, there were red punctae, and also some areas of telangiectasia. At the time of presentation the eruption on the trunk had practically disappeared, but the legs were still involved, with yellowish-brown pigmentation.

DISCUSSION

DR. WILE: This is not Schamberg's progressive pigmentary dermatosis, although there is a resemblance. It is fading too rapidly, and is too pale. It

looks more like an evanescent purpura; the location of the lesions and the patient's age also suggest purpura.

DR. JAMIESON: Several weeks ago the eruption was more erythematous, but there has been no change in the last three weeks. There are cayenne pepper-like punctae.

LYMPHANGIOMA. Presented by DR. SCHILLER, DR. PERKINS and DR. SCHLEGELMILCH.

L. S., aged 20, a housewife, had first noticed a pigmentation of the right side of the trunk, from the costal margin upward, in the spring of 1926, while she was pregnant. During pregnancy the pigmentation deepened, and two weeks after delivery verrucous excrescences appeared over the pigmented area; they were reddish brown, and varied from the size of a pinhead to that of a pea. The patient's mother and sister were said to have the same condition.

NODULAR SYPHILID. Presented by DR. SHAFFER.

Mrs. C., aged 59, a widow, had had two children, who were living and well; there had been no miscarriages. On the extensor surface of the left forearm was a group of pea-sized nodules, with some atrophy. The Wassermann reaction was positive.

GUTTATE PSORIASIS. Presented by DR. SCHILLER, DR. PERKINS and DR. SCHLEGELMILCH.

A. D., a woman, aged 30, said that she had had psoriasis since she had first been vaccinated, in childhood. It recurred each spring and fall. There was a generalized eruption of lesions varying in size from that of a pinhead to that of a pea, the scales being rather greasy.

A CASE FOR DIAGNOSIS. Presented by DR. SCHILLER.

H. P., a schoolgirl, aged 13, presented a pruritic eruption of small erythematous scaling macules on the arms, breast and legs, of short duration.

DISCUSSION

DR. SHAFFER: The presence of lesions on the foot suggest dermatophytosis.

DR. WILE: The appearance of the eruption suggests pityriasis rosea.

DR. JAMIESON: I recently found mycelia in a similar case.

SYPHILITIC GUMMAS. Presented by DR. SCHILLER, DR. PERKINS and DR. SCHLEGELMILCH.

M. R., a woman, aged 32, had had one miscarriage; she had had some antisyphilitic treatment. A nodule had appeared on the left forearm two months previously; it had broken down, and its base was infiltrated. On the inner surface of the left elbow there was a somewhat inflamed tumor mass, and over the left hip there was a plum-sized, broken-down mass.

DISCUSSION

DR. WILE: The lesion on the wrist looks like a gumma, and the epithrochlear lymph node enlargement may be gummatous, likewise the lesion on the hip. They seem too widely scattered for sporotrichosis.

DR. SHAFFER: In view of the possibility of sporotrichosis, I would suggest that mercury rather than the iodides be used in the therapeutic test.

H. J. PARKHURST, M.D., Reporter.

CHICAGO DERMATOLOGICAL SOCIETY

Regular Meeting, March 16, 1927

FRANCIS EUGENE SENEAR, M.D., *Presiding*

A CASE FOR DIAGNOSIS. Presented by DR. SENEAR.

A man, aged 38, had a lesion on the right thigh, which had persisted for fifteen or twenty years. It began as a small patch in the right crural region following an injury which he received in a fall, and had spread gradually.

On the right thigh, running from the lower portion of the crural region outward and upward toward Poupart's ligament, was a large patch in which the skin presented atrophy, pigmentation, some sclerosis and telangiectasia.

DISCUSSION

DR. HARRY R. FOERSTER: I would hesitate to make a diagnosis because of the localized process, but the picture presented is suggestive of poikiloderma atrophicans vasculare.

DR. DRIVER: If there is such a thing as localized poikiloderma, I think that diagnosis would fit.

DR. STILLIANS: I think the case belongs in that group. There are all variations between macular atrophy and poikiloderma.

DR. SENEAR: I had thought of a diagnosis of poikiloderma and scleroderma in the late stage. The outer, shiny portion seems to show a little sclerosis, and as scleroderma sometimes ends with the appearance of acrodermatitis chronica atrophicans, I thought of that possibility. I hesitated to make a diagnosis of poikiloderma because of the localization. I will try to secure a biopsy.

LICHEN PLANUS (WITH LESIONS OF THE MUCOUS MEMBRANE). Presented by DR. SENEAR.

A man, aged 35, presented lesions of seven years' duration. His dentist first called attention to the fact that the dorsum of the tongue and buccal mucosa were covered with whitish lesions. These had persisted apparently unchanged for seven years. He had not received any treatment.

On examination, the dorsum of the tongue was seen to be practically covered with a fairly thick, whitish, leukoplasic appearing process, while the buccal mucosa showed a number of whitish points and lines. There were no lesions on the body.

DISCUSSION

DR. ZEISLER: The diagnosis lies between leukoplakia and lichen planus of the tongue, and of the two I would favor lichen planus.

DR. STILLIANS: I think it is a case of leukoplakia but could not decide anything from the section. It was not typical, but I think leukoplakia can make the picture that we saw on the buccal mucosa.

DR. FINNERUD: I think that it is a case of lichen planus because of the sharply defined and rather dense infiltration. There was the hyperkeratosis that goes with lichen planus, as well as with leukoplakia, but because of the infiltrate, which does not characterize leukoplakia, I favor the former diagnosis.

DR. PARKHURST agreed with the diagnosis of lichen planus.

DR. HARRY R. FOERSTER: I favor a diagnosis of leukoplakia because of the pronounced hyperkeratosis, and I am not convinced by the histologic conditions.

DR. SENEAR: I am in favor of lichen planus, in spite of the histologic conditions, which are not typical. The lesions on the buccal mucosa were not typical, but I did not like to bring in two conditions to explain the picture. I think we cannot be certain.

MACROCHILIA (SOLID EDEMA). Presented by DR. OLIVER and DR. FINNERUD.

A girl, aged 14, had a swelling of four years' duration which involved the upper lip only. The mother says that while the swelling had at times receded, the lip has never returned to normal. There was no history of erysipelas. The tissue was considerably indurated.

DISCUSSION

DR. PARKHURST: I think it is a case of lymphatic obstruction starting with infection. I wonder what an examination of the nose and throat would show.

DR. HEDGE: I thought of a lymphatic involvement, probably with involvement of some of the sinuses or antrums. I think it is more likely this condition than lymphangioma.

DR. PUSEY: It seems to me more likely to be a recurrent lymphangitis from infection from the lip rather than from above.

DR. MITCHELL: The greatest activity of the lesion seemed to be along the mucocutaneous junction, and the patient said she had crusts and sores on the lip all the time. I think it is probably a pneumococcus streptococcus lymphangitis, arising from repeated attacks of herpes labialis.

DR. FINNERUD: I thought it was a macrochilia, or solid edema. Before the change in the lip took place the patient had recurrent canker sores in the mouth most of the time, but she said that they were never present on the lip. She now has some such involvement of the lip. In the beginning, the swelling almost disappeared at times, but it has become practically stationary. I think that the symptoms fit in with the characteristic history in cases of solid edema.

DR. OLIVER: I think as Dr. Pusey does that the condition is a solid edema, with infection from the lower border of the lip. I doubt whether an examination of the nose or antrums would show anything. I have a case of persistent solid edema which shows nothing definite, and the patient has been thoroughly examined by competent specialists in conditions of the nose and throat.

TOXIC ERUPTION OF PREGNANCY, MULTIFORM ERYTHEMA TYPE. Presented by DR. EBERT.

A woman, aged 31, was six months pregnant. An eruption of red blotches on the forearms had appeared two months prior to presentation. About two weeks later, similar lesions appeared on the thighs. Within the past three weeks the lesions had appeared on the trunk and had changed in character,

many large bullae being present. There had been considerable intermittent itching from the first. This was her third pregnancy; the first was normal. During the eighth month of the second pregnancy an eruption similar to the present one appeared and had persisted for two weeks.

Scattered over the trunk and arms were numerous, small to large coin-sized, dull red, edematous macules with a small raised margin. The lesions were larger on the forearms, and the margins were vesicular. There were also several scattered bullae varying from the size of a pea to that of a walnut. Some of these were filled with clear fluid and others were hemorrhagic.

DISCUSSION

DR. STILLIANS: I thought that this case might be put in the erythema multiforme group.

DR. MITCHELL: Clinically, to me, it is a case of bullous multiform erythema complicating pregnancy, but the etiologic factors may have to be determined.

DR. HARRY R. FOERSTER: I agree with this diagnosis.

DR. DRIVER: I have recently seen a similar case in which a woman gave a history of having the same type of eruption during three pregnancies. The first was not so severe, the next was much more severe, but she managed to carry the baby to term, and the condition cleared up after the child was born. The last attack was the most severe and extensive erythema multiforme that I have ever seen, and was practically generalized over the entire body. She suffered greatly, and as the eruption would not respond to any type of therapy, a therapeutic abortion became necessary.

DR. MITCHELL: Did you try calcium?

DR. DRIVER: We tried chiefly the salicylates, local application and roentgenotherapy.

DR. MITCHELL: I think it would be interesting to try calcium intravenously in these cases. Even if it does no good, it will do no harm.

DR. EBERT: There was an eosinophil count of 5 per cent. I think the case is interesting because the condition occurred during pregnancy.

CONGENITAL ALOPECIA (COMPLETE). Presented by DR. OLIVER and DR. FINNERUD.

An extremely nervous and fretful child, aged 2, had no family history of alopecia. There was no change in the nails, nor any evidences of epidermolysis bullosa. There were a few hairs about the periphery of the scalp at birth, but these soon dropped out. The scalp was absolutely bald, and there were no eyebrows or eyelashes.

DISCUSSION

DR. FINK: Some time ago we had two cases of alopecia totalis which occurred in brothers at about the age of 1 week. There was hair at birth, but in each case the hair completely disappeared. No laboratory tests were performed, but the children apparently were normal. One of the patients regrew hair after a year, and the other after about a year and a half. They have since disappeared from observation.

DR. OLIVER: There is no family history that has any bearing on the condition, and there are no changes in the nail. The child had a fine fringe of hair about the periphery of the scalp at birth, but that disappeared. In most of the cases of congenital alopecia that have been reported there has been some hair at birth which soon disappears. In the cases I presented two years ago the boys

had hair at birth, but this dropped out entirely and then started to regrow. The elder boy afterward developed a fairly normal head of hair. We will have the basal metabolism test made if possible, but I doubt if it can be done in a child of this age.

ERYTHEMA INDURATUM WITH A POSITIVE WASSERMANN REACTION. Presented by DR. EBERT.

A woman, aged 36, had lesions of four months' duration on the legs, from the knees to the ankles. They consisted of numerous lumps underneath the skin. The first was noticed in November, 1926, and since then new lesions had continued to appear, starting as subcutaneous nodules which became attached to the skin and were deep reddish brown. There was a moderate amount of soreness at first. Some of the lesions had healed spontaneously; the larger ones had ulcerated. A large ulcer on the right ankle had been present about three weeks and had improved markedly since she had received two injections of neoarsphenamine. The patient had been married for eight years, and her husband had died of pneumonia. She had had one stillbirth, followed by hysterectomy.

There were three large coin-sized, infiltrated, reddish-brown plaques on the lower third of each leg. About the right inner malleolus there was a deep, punched-out ulcer, the size and shape of a silver half dollar with a granulating floor covered with pus. There were several brownish, subcutaneous nodules varying in size from that of a pea to that of a bean. The Wassermann reaction on the blood serum was strongly positive.

DISCUSSION

DR. PARKHURST: I think there are two possibilities in this case — erythema induratum and gumma. I believe that with the short duration and rapid progress of the condition, the diagnosis of a syphilitic lesion is most likely.

DR. STILLIANS: I think it is a case of erythema induratum because of the hardness of the lesions, and the location of some of them in the specific areas, in spite of the fact that some of them have cleared up on arsphenamine therapy.

DR. DRIVER: I favor the diagnosis of erythema induratum. The larger ulcer was rather punched-out and deep for this disorder, but I have seen other cases in which it was just as deep.

DR. HEDGE: I was interested in seeing the section from this case. It showed the typical giant cells, and Professor Gans said it must be remembered that this is not typical of erythema induratum any more than any other chronic inflammatory process. The fact that the lesions cleared up under antisyphilitic treatment would make me favor a diagnosis of a syphilitic condition.

DR. MITCHELL: I felt that clinically the condition was erythema induratum. I do not think it necessarily need be tuberculous nor syphilitic. It is embolic and might be due to one of several etiologic factors.

DR. FINNERUD: When these cases are presented, gummatous syphiloderm is almost always mentioned as a possible diagnosis. It has been my experience that gummatous lesions are not symmetrical unless occurring simultaneously from trauma. This patient has numerous bilaterally distributed small lesions. I think clinically it is a case of erythema induratum, and it seems to me the microscopic picture confirms that diagnosis. Erythema induratum is usually different from gumma histologically. I agree that it is not always possible to differentiate them, but if the biopsy is taken from the center of the lesion

and extends well into the hypoderm, hypertrophy is seen and not uncommonly a thrombosis of the vein or artery or of both. The involved portion of the hypoderm is a network of epithelioid, lymphocytic, plasma and giant cells, which extend well up into, or through the corium, in well developed lesions. The section presented has all the typical changes except the changes in the blood vessel, and I imagine that is missing because the deeper tissues were not included in the biopsy.

DR. HARRY R. FOERSTER: How much arsphenamine has she had?

DR. EBERT: Very little.

DR. HARRY R. FOERSTER: I would suggest treatment with mercury and iodide and discontinuing the arsphenamine.

DR. EBERT: The case impressed me as being erythema induratum in spite of the strongly positive Wassermann reaction.

DR. SENEAR: I thought it was erythema induratum. One of the patches on the calf did not feel like a gummatous lesion.

LUPUS ERYTHEMATOSUS. Presented by DR. SENEAR.

A man, aged 24, employed as a clerk, presented an eruption in the flush portion of the cheeks, which began three months prior to presentation. He says that ten years before he had had a similar eruption on the face. When first seen early in January, 1927, several superficial erythematous lesions were present on each cheek. These had persisted with varying intensity since that time, and on two occasions had become somewhat infiltrated and definitely palpable, suggesting the possibility of beginning sarcoid. During the past two weeks the lesions had extended and become confluent, to form a larger patch on each cheek. Physical examination was negative. A roentgenogram of the teeth revealed moderate alveolar absorption.

DISCUSSION

DR. FINNERUD: I thought this was a case of lupus erythematosus. I presume Dr. Senear presented the patient because when he first saw him the lesions were smooth and soft. We had a case recently in which the condition was of but two weeks' duration. At first we could not decide whether it was sarcoid, beginning lupus pernio or lupus erythematosus, but within a few weeks it was easily seen to be lupus erythematosus of the discoid type.

DR. SENEAR: It is the first time I have ever had an opportunity to watch a lupus erythematosus develop practically from its inception. It has been interesting to watch it pass through the stages of edema, but during the last two weeks the original lesions have became confluent and formed patches, and I think it is now definitely lupus erythematosus. I have watched the case for about seven weeks.

DR. MITCHELL: A number of years ago Dr. Ormsby and I saw a man with an acute dermatitis on the cheek which did not suggest lupus erythematosus. We watched it progress in the course of about six months from a simple mild dermatitis to a typical lupus erythematosus.

SCROFULODERMA GUMMOSA (TUB. COLLIQUATIVA). Presented by DR. ZEISLER.

An Austrian, aged 21, had an extensive eruption of the front and sides of the neck, of the axillae and right knee, the groin and inguinal region of eight years' duration. He had been under observation but a few days, and

in that time he had run a normal temperature, except on one day when it was 100 F. toward evening. A roentgenogram showed evidence of an old and inextensive process, probably tuberculous, of the hilum of each lung.

Examination showed marked scarring in the cutaneous areas mentioned as relics of old lesions and a few active ones in practically all areas.

SAN FRANCISCO DERMATOLOGICAL SOCIETY

Regular Meeting, March 18, 1927

GEORGE D. CULVER, M.D., *Presiding*

TUBERCULOSIS OF THE TONGUE. Presented by DR. STIBBINS.

A small ulcer appeared on the under surface of the tongue near the frenum in May, 1926. The patient gave a history of pulmonary tuberculosis two years previously. The ulcer had enlarged to the size of a half dollar and was tender. An examination of the sputum for tubercle bacilli was positive. The patient was presented for therapeutic suggestions.

DISCUSSION

DR. MILLER: I have seen a number of these cases at the San Francisco Hospital. Whenever it is possible, excision is advisable. It is folly to do a biopsy as it seems to light up the process. Roentgen-ray and radium treatment are of no value, and excision should not be used in advanced cases. General hygienic treatment is of value.

A CASE FOR DIAGNOSIS. Presented by DR. MEADS.

A dentist, aged 50, had had recurring erythematous nodules on both lower limbs during the past two years. They appeared singly or in groups on various parts of the legs. There had not been an interval of freedom of more than two months' duration. The lesions were still red, about the size of a quarter and slightly tender, and they involuted spontaneously within six weeks without atrophy or scarring; ulceration was absent. All foci of infection had cleared up. The patient was presented with a tentative diagnosis of nontuberculosis erythema induratum.

DISCUSSION

DR. MORROW: The diagnosis of erythema nodosum cannot be excluded, although many individual lesions of erythema induratum do not ulcerate; they usually heal leaving atrophic scars. I think the condition is erythema nodosum.

CASES OF ROENTGEN-RAY DERMATITIS. Presented by DR. TEMPLETON.

CASE 1.—A man, aged 28, exposed his hands repeatedly to an unprotected roentgen-ray tube three years before presentation while working in the department of physics in one of the universities. Each dose contained about two skin units of unfiltered roentgen ray. Within two weeks a second degree roentgen-ray dermatitis appeared. After prolonged local treatment, the skin healed, with resulting atrophy and telangiectasia. One year previously, keratoses began to appear. I removed these by electrodesiccation ten months ago. The patient is presented to demonstrate the value of this form of treatment.

CASE 2.—Miss F., aged 40, presented an area of atrophy and telangiectasia about 6 inches (15.24 cm.) in diameter over the region of the thyroid. This appeared following a roentgen-ray dermatitis received in 1914. Within the last year many keratoses have developed. They are now being removed by electrodesiccation.

DISCUSSION

DR. CULVER: I have recently seen a case of roentgen-ray dermatitis of the back in which the patient did well with Tiersch grafts. The grafts would be of use only over flat surfaces. I should not advise radium treatment for the keratoses except in select cases. Electrodesiccation is undoubtedly the best method of treatment. Grafts often must contain deeper structures of the skin.

DR. TAUSSIG: Electrodesiccation is the safest method of treatment for keratoses.

CASES OF ALLERGIC DERMATITIS. Presented by DR. ROWE.

CASE 1.—E. E., a woman, aged 20, had severe generalized eczema during the first two years of life. Since then it had gradually decreased in severity, though there was a definite recurrent type of eczema constantly present on the hands, the face and other parts of the body. Nasal congestion had always been present, but during the last few years there had been complete occlusion. This condition had persisted, which was the reason for the opening of both antrums and the recent removal of the septum. The operation did not give any relief.

The patient gave positive reactions to several pollens, *Ambrosia, Artemisia, Graminae* and *Amaranti,* positive reactions to several dust extracts from the stock house and marked positive reactions to several animal proteins, especially to horse hair and sheep wool. Skin tests with food proteins gave positive reactions to wheat, milk, grapefruit, celery and peanut proteins.

This case was presented to show characteristic reactions to food, animal emanation, pollen and dust protein, and to exemplify a case of marked allergic manifestations.

CASE 2.—N. K., a girl, aged 5, had had eczema over her face, arms and legs for two years which had resisted all general dermatologic therapy. She was referred to me by Dr. Morrow for allergic investigation. Skin testing showed positive reactions to wheat and milk and marked reactions to horse hair and a one plus reaction to feather protein. During the last year her environment had been made free from horse dander dust, and she had been on a milk-free and wheat-free diet. She had been given calcium lactate by mouth to make up for a possible calcium deficiency in the diet.

The eczema had entirely disappeared from the neck and face, and was only slightly present on the arms and legs, due to occasional contact with horse dander protein. Her parents objected to desensitization with horse dander protein solution. A return to the diet containing wheat and milk produced a marked recurrence of generalized eczema.

A CASE OF ERYTHEMA ELEVATUM DIUTINUM (CROCKER). Presented by DR. TEMPLETON.

Miss B., aged 20, presented an elevated, sharply marginated normally colored, firm plaque about 1.5 cm. in diameter over one knuckle of about sixteen months' duration. There had been no subjective symptoms nor any change in size during the last year. The clinical diagnosis was erythema

elevatum diutinum (Crocker). The microscopic change was that of granuloma annulare. This observation would tend to substantiate the view that erythema elevatum diutinum was a subvariety of granuloma annulare.

DISCUSSION

DR. MORROW: I think the case is one of granuloma annulare, both clinically and pathologically.

DR. MILLER: The pathologic condition is that of granuloma annulare.

A CASE OF CUTIS VERTICIS GYRATA. Presented by DR. TEMPLETON for DR. ALDERSON.

This case is similar to one previously seen by Dr. Alderson in which the microscopic change was that of a neurofibroma. The sections were studied by Dr. Jadassohn, who concurred in the diagnosis. Sections will be prepared from the present case.

BROOKLYN DERMATOLOGICAL SOCIETY

Regular Meeting, March 21, 1927

JOHN C. GRAHAM, M.D., *President, in the Chair*

TUBERCULOSIS OR SYPHILIS. Presented by DR. E. A. GAUVAIN.

M. H., an unmarried German girl, aged 30, one year before presentation had an upper plate which irritated her mouth. When she went to her dentist to have this corrected, he found a "gum-boil" at the junction of the gum with the labial mucosa. The dentist incised this but did not obtain any free pus. For the next six months the lesion discharged continually, and in November, 1926, the jaw bone was curetted at the Long Island College Hospital, and the Koch bacillus was demonstrated in the scrapings. Following this operation the patient developed an erythematous, definitely outlined, lesion on the upper lip, with a few small nodules around its periphery, and with small scales over its surface. This was followed by the development of several hard, subcutaneous nodules about the size of a pea.

Physical examination of the heart and lungs was negative. The urinalysis and the Wassermann reaction were also negative. The patient had received twenty systemic ultraviolet irradiations, with slight improvement.

DISCUSSION

DR. ABRAMOWITZ: Of course the finding of tuberculosis in the scrapings of the bone lesion is conclusive as far as the lesion in the bone is concerned. However, I cannot feel that the lesion on the lip is lupus. There is a definite serpiginous arrangement, and I think it might not be a bad suggestion, whether the Wassermann reaction is negative or not, to try a course of arsenic and bismuth, before accepting the diagnosis as final.

DR. HECHT: I agree with the diagnosis of syphilis.

DR. THRONE: I agree with the diagnosis of tuberculosis.

DR. RULISON: I think that the condition is tuberculosis of the skin, but not lupus vulgaris.

REPORT OF A CASE. Presented by DR. SKEER for DR. ABRAMOWITZ.

L. S., a married woman, aged 60, had had a small vesicle on the right side of the tongue for twenty-five years. This blister-like lesion would rupture but after a short interval would form again. In the early stages, the lesion was slightly painful. She presented a cystlike mass the size of a hickory nut, on the right side of the tongue, which was not painful. The capsule seemed to be translucent and had numerous venules running through it. The veins under the tongue were enlarged and varicose.

DISCUSSION

DR. ALTMAN: I think that the condition is a multiple cyst, and would recommend surgery.

DR. WALZER: I thought of three possibilities. It might be a multilobular cyst, or a lymphangioma or hemangioma which has become cystic. With lymphangioma or hemangioma, one gets other lymph or angiomatous cysts scattered over the tongue. None of these was observed. I believe that this is a hemangioma that has become cystic.

DR. THRONE: A biopsy will probably show more definitely what it is.

DR. ABRAMOWITZ: I think that the diagnosis of a cyst here is connected with some risk. A puncture may lead to hemorrhage. It is my impression that a cystic tumor of such a long duration is probably some sort of nevus, evidently of benign nature, and most of these are either lymphangiomas or hemangiomas, or both. It seems that if any operative procedure is to be taken, it would be better to seal off the lesion entirely with the endotherm knife before removal.

ACRODERMATITIS CHRONICA ATROPHICANS (?). Presented by DR. WALZER.

M. M., a widow, aged 60, the mother of nine children, gave no relevant history. Her condition, which was of twenty years' duration, began with itching and redness on the extremities. There were lesions on the neck and shoulders of ten years' duration, and on the chest and axillae of one month's duration. The chief complaint was terrific itching, especially on the upper part of the body. At presentation, there were two types of lesions: (1) acrodermatitis atrophicans on the upper and lower extremities; (2) on the back of the scalp, the ears, neck, the upper chest in front of the shoulder joints, the axillary side of the right breast and the cubital fossae, were large, erythematous plaques, with a distinct, sharp border, which looked like patches of lichenification, but which were of unusually large size. They were somewhat infiltrated; the skin markings on them were exaggerated, and were covered with fine, almost psoriatic scales. The borders were pigmented dark brown. In both cubital fossae and also on the upper part of the chest and neck, individual primary lesions could be seen as tiny, erythematous points or papules the size of a pinhead, which were smooth and shiny and covered with fine whitish scales. These individual lesions conglomerated into the larger patches. Over the entire upper part of the body between these patches, the skin was highly pigmented, with scattered spots, from the size of a pinhead to that of a pea, of diminished pigmentation or vitiligo, scattered throughout.

DISCUSSION

DR. BEST: I think it is a case of lichen planus.

DR. RULISON: I think the lesion on the upper part of the body might be neurodermatitis.

DR. SKEEP: It seems that both feet are more or less sclerotic. There is hard, tense skin with atrophy. Perhaps the patches around the neck will be scleroderma, although they look like lichen planus hypertrophicus.

DR. HECHT: The lesions around the elbow are typical of lichen planus, although those around the neck might possibly suggest neurodermatitis.

DR. BERKOWITZ: I have never seen papules of lichen planus look like the lesions on this patient's neck, and as to the diagnosis of neurodermatitis, the lichenification and thickening are far too little for the ten years' duration that is claimed.

DR. BEST: Around the large areas of so-called neurodermatitis, a great many isolated, angulated, violaceus, lichenified papules the size of a pinhead can be seen.

DR. ABRAMOWITZ: There is no doubt that the patient has acrodermatitis. There also does not seem to be any doubt about the neurodermatitis. The patches on the wrist suggest lichen planus atrophicus.

DR. WALZER: The lesions on the lower part of the legs are not scleroderma, but scleroderma-like patches of atrophy. As to its being lichen planus, the large patches on the back are not lichen planus, nor do they look like anything observed in lichen planus. The tiny, scattered lesions are not lichen planus, but rather lichenoid papules caused by scratching. Neurodermatitis, as suggested, might be considered, but why is there not more infiltration in a patch of ten years' duration? To my mind the whole process is that of some intoxication producing a dermatitis, but I do not know where to place it.

PEMPHIGUS VULGARIS. Presented by DR. PRICE for DR. BEERS.

A private detective, married, born in the United States, aged 54, was in good general health up to August, 1926, when he noticed an eruption beginning on his neck and spreading to the scalp and downward over his body. The eruption consisted of bullae, which varied in size from that of the head of a match to that of an olive, and which contained clear serous fluid which later became cloudy. In a short time the distribution became generalized, including the scalp, mucous membranes, palms, soles, genitalia, and the entire surface of the body with the sole exception of the calves of both legs. The bullae would rupture or be ruptured, leaving a bright red, denuded surface which would become crusted and in turn would drop off. Nikolsky's sign was present. The bullae arose from the normal skin, and were tense. New lesions appeared at the border of the old ones. At times the denuded areas were extensive and seriously incapacitated the patient. The general course of the condition had been one of repeated outbreaks of the lesions which healed up, to be followed shortly by another outbreak. The patient had lost considerable weight and strength. The Wassermann reaction, blood chemistry, urinalysis, blood cultures, and cultures from the blebs were negative. The blood count was normal.

DISCUSSION

DR. THRONE: I cannot see that the case is anything but pemphigus.

DR. BEST: While the presenter of the case states that the lesions apparently came out from the normal integument, I saw evidence of distinct areola. The lesions of dermatitis herpetiformis may come from the normal skin, or from an erythematous base. There was also some grouping. In view of the grouping and the erythematous bases, I am inclined to think of dermatitis herpetiformis in this case.

DR. WALZER: I agree with Dr. Best. These lesions are tense and seem hard. The bullae are apparently formed deeper down than is usual in pemphigus, and the entire epidermis covers the bullae. In the usual cases of pemphigus, no bullae are seen in the mouth as such; but raw red surfaces, with suggestions of the bullae, are seen. In this man, distinct, hard vesicles and bullae are seen intact. It may be a case of dermatitis herpetiformis, but to my mind it is one of those borderline cases that shows the connection between dermatitis herpetiformis and pemphigus.

DR. BERKOWITZ: In dermatitis herpetiformis there is more pigmentation left when the lesions heal. I think that it is a case of pemphigus.

DR. HECHT: I can see nothing in this case to agree with the diagnosis of pemphigus. I agree with the diagnosis of dermatitis herpetiformis.

DR. SKEER: The man said that the condition began as a burning sensation, not itching. The bullae are not deep, but superficial. The patient broke one of them in my presence. I do not think there is much grouping. It is a generalized eruption, and one can see only a grouping of vesicles if he looks at one spot. I could not elicit the Nikolsky sign. There are no excoriations which one would see in dermatitis herpetiformis. There is no pigmentation that I could see. There is more or less of an erythematous skin which the presenter says clears up and leaves normal skin. I think it is pemphigus.

DR. ABRAMOWITZ: I agree with the diagnosis of pemphigus vulgaris. I do not think there is sufficient grouping here, and there are not enough subjective symptoms to make a diagnosis of dermatitis herpetiformis. I would advise the presenter to put this patient on massive doses of arsenic.

DR. BEST: It seems to me that in pemphigus of eight months' duration there would be more undermining of the patient's general health.

DR. PRICE: The man had lost considerable weight since the first time I saw him. Three weeks ago, he was in a bad condition. As to the suggestion of arsenic, he has not received massive doses, but since the time that Dr. Beers saw him, he has been on Fowler's and Donovan's solutions given together, receiving 5 drops of each twice daily. In arguing against dermatitis herpetiformis, there is usually some pigmentation left, besides the grouping which is characteristic in the bullous formations. Between his attacks there is no pigmentation; the skin is normal. An attack will last for two or three weeks and will clear up and be perfectly normal. As far as the depth of the lesions is concerned, Dr. Beers told me that when they desquamated, the skin looked like raw meat. It seems to me that if the lesions were deep, there would be some scarring in healing.

BASAL CELL EPITHELIOMA. Presented by DR. L. CHARGIN.

A. B., a man, aged 62, had had a lesion for six years, which began as a comedo-like lesion on the right side of the nose. This gradually ulcerated and spread until the entire right nostril and upper lip were involved. The floor of the ulcer was irregular and shiny and the border was infiltrated. The Wassermann reaction was negative. No treatment had been applied. The septum was not perforated. The patient was presented for suggestions as to treatment.

DISCUSSION

DR. ABRAMOWITZ: I think this case is difficult to handle on account of the involvement of the cartilage. Perhaps the best way to destroy the lesion would be by surgical diathermy and radium.

DR. BEST: I would use electrocoagulation in this case.

DR. SKEER: I had a similar case several years ago. Treatment consisted of curettage and application of acid nitrate of mercury (Sherwell). The patient was cured, but there was a hole through the nose.

DR. RULISON: I should think that surgical measures followed by a plastic operation would be best.

DR. THRONE: I agree with Dr. Rulison. The Skin and Cancer Hospital seems to be the dumping ground of many of these cases. We have had patients that were treated with everything. In a case of this kind I feel that nothing will give the patient the chance that a radical surgical operation will.

DR. GRAHAM: I agree with Dr. Throne. I would not use radium.

LICHEN PLANUS HYPERTROPHICUS. Presented by DR. GAUVAIN.

URTICARIA PIGMENTOSA. Presented by DR. SKEER and DR. ALTMAN.

ERYTHEMA MULTIFORME. Presented by DR. WALZER.

VON RECKLINGHAUSEN'S DISEASE. Presented by DR. GRAHAM.

E. ALMORE GAUVAIN, M.D., Secretary.

NEW YORK DERMATOLOGICAL SOCIETY

Regular Meeting, March 22, 1927

H. H. WHITEHOUSE, M.D., *Chairman*

BOWEN'S PRECANCEROUS DERMATOSIS. Presented by DR. FRASER for DR. SCHWARTZ. (From the Cornell Clinic.)

A man, aged 59, American by birth, gave a history of having taken arsenic over a period of eight years (from the age of 7 to 15) for the relief of chorea. The duration of the skin condition was forty-five years. Examination showed numerous irregularly shaped, scaly, flat, reddish-brown patches ranging in size from that of a pinhead to one half inch (1.27 cm.) or more in diameter. Almost all the lesions were discrete, but in certain areas, especially on the back, there was a tendency to confluence. The majority were macular; some were slightly raised and a few were definitely nodular in type. The palms and soles were smooth, and with the exception of a small area under the left eye, the face was free from lesions.

The case was presented as a possible example of Bowen's disease. The microscopic observations on sections taken from three widely separated lesions were identical with those of Bowen's precancerous dermatosis.

DISCUSSION

DR. CLARK: I agree with the diagnosis. The interesting feature is the history of the man's having taken arsenic for a period of seven or eight years. At the Skin and Cancer Hospital the staff has been greatly interested in old arsenical cases, and there have been some patients who developed arsenical lesions many years after any possible arsenical exposure.

DR. WILLIAMS: I saw the patient about thirteen or fourteen years ago, and diagnosed the condition as seborrheic warts at that time. The patient then gave the same history as now. Many of the lesions had been treated with nitric acid.

The patient told me at that time that salicylic acid plaster had done as much good as anything. He also told me of Dr. Fordyce's examination, and said that the slides showed a mass which was neither tuberculous nor malignant; both these possibilities were ruled out.

DR. WISE: I think that the lesions represent, in part, multiple flat epitheliomas and, in part, arsenical keratoses. I do not think the diagnosis of Bowen's disease is applicable.

DR. HIGHMAN: Two questions come up in connection with this case. When I saw the patient across the room, and Dr. Fraser described the slides, the condition looked to me like a typical case of Bowen's disease. The factors against Bowen's disease that are not particularly valid, are the duration of the condition for forty-five years, beginning at the age of 14 with wide distribution over the body, and the fact that after such long duration there is no frank malignancy, which was present in four of the seven recorded cases. The clinical appearance of the individual lesions is in favor of Bowen's disease; the fact that they are flat with no tumefaction is rather in favor of Bowen's disease than against it. Whether it is arsenical keratosis or Bowen's disease, the patient has some potentially malignant condition; but why should he have an arsenical keratosis since the age of 14? It must be a disease *sui generis* and have no connection with arsenic. Histologically, from Dr. Fraser's description, I cannot entertain any other possibility than Bowen's disease. I also think that this condition is closely related to the extramammary form of Paget's disease, and that the extramammary form has nothing to do with the other form of Paget's disease. As to therapy, when a man of 59 has had a condition for forty-five years, even though it would not hurt him to try Dr. Clark's suggestion, it would be just as well to let him alone and gamble on the eleven or so years he has yet before him.

DR. ELLER: Clinically, the lesions look like multiple epitheliomas of the skin. Radium or roentgen rays will cure them without pain. I believe that a sharp erythema dose of either of these agents will cure most of them after one treatment.

DR. LANE: My impression is that the condition is multiple superficial epitheliomatosis. If it is, I do not think that the sodium thiosulphate will have any influence, even though arsenic may have been a causative factor. My experience with the roentgen ray has been somewhat different from that described. I have found that the dosage of roentgen ray has to be high, three or four skin units, to have much effect, and even that dosage is ineffectual and the lesions have to be cut out. I presume there may be some difference of response to the roentgen rays in different patients.

DR. WHITEHOUSE: I feel rather unqualified to differentiate between Bowen's disease and multiple epithelioma. To me, the picture is one of multiple benign epithelioma; but I do not see why it would do any harm to investigate the effect of sodium thiosulphate. It is worth trying, especially if the man does not want to be hurt; and it might be tried to see if arsenic is in any way responsible.

DR. FRASER: I cannot accept the view expressed by members that this is a case of chronic arsenical poisoning. There is a history of ingestion of arsenic, but not every one who takes arsenic gets arsenical keratosis. The two chief features of this condition, viz., palmar and plantar keratosis, and pigmentation, are absent. Histologically, Bowen's precancerous dermatosis and arsenical keratosis are similar. In fact, the epidermal changes may be identical. It would seem, however, that there is a greater amount of cellular infiltration in the corium in cases of arsenical keratosis. I do not deny the possibility of arsenic as an etiologic factor; but the balance of the evidence, both clinical and histologic, is in favor of the view that the condition is Bowen's precancerous dermatosis.

MYCOSIS FUNGOIDES. Presented by DR. WISE.

J. T., a man, aged 63, presented lesions on the back of the neck, which first appeared four years previously. He had consulted several dermatologists, all of whom made a diagnosis of seborrheic dermatitis. Dr. Wise first saw the patient about a year before and made the same diagnosis. He then presented medallion-like, scaly, noninfiltrated lesions on the back and chest. These lesions appeared to be the ordinary form of seborrheic eczema. After a lapse of six months, the patient returned presenting scattered nodular, circinate, garland-like and moderately infiltrated lesions on the forearms, face, neck and lower extremities, mostly the thighs and legs, posteriorly. Itching was moderate in degree. Unfiltered roentgen-ray treatment caused an almost total regression of the lesions, leaving yellow stains. The histologic examination confirmed the clinical diagnosis.

HODGKIN'S DISEASE WITH SKIN MANIFESTATIONS. Presented by DR. C. M. WILLIAMS.

Mrs. M. L., a Jewess, born in New York, aged 38, began having trouble with her skin four years before presentation. She was shown at the New York Academy of Medicine, Dermatological Section, a little over two years before, with the diagnosis of premycosis (mycosis fungoides). The blood picture at that time was negative, as was also the Wassermann reaction, and the urine was normal. The blood picture on Feb. 21, 1927, showed secondary anemia.

At presentation, the lesions were multiform. On the torso and face were slightly indurated, rounded, circinate, and in some instances serpiginous, dusky red lesions. On the arms and legs were numerous shotty papules that were itchy and had been badly scratched. Round, thickened, glistening plaques occurred on the scalp with some telangiectasis, and a loss of hair over the patches. Practically all the superficial lymph glands were palpable, some having increased in size so that they measured from 1 to 2 inches (2.5 to 5 cm.) in diameter. All lesions had responded to suitable doses of the roentgen ray.

DISCUSSION

DR. WISE: I would offer a tentative diagnosis of leukemia cutis, based on the peculiar, large, infiltrated lesion on the temple, rather than the papular lesions on the shins.

DR. FRASER: The blood picture of anemia and the tendency of the lymph nodes to be aggregated in confluent masses speak against a diagnosis of leukemia, and in favor of Hodgkin's disease. The lesions on the skin are not those of Hodgkin's disease in the sense that they are the expression of the same pathologic changes as are found in the nodes. They are pruriginous and fundamentally different histologically.

DR. ELLER: I think, as Dr. Fraser does, that the condition is Hodgkin's disease. One frequently sees a normal blood picture in early cases of this disease. A further blood study will have to be made to reach a definite diagnosis.

DR. HIGHMAN: I think the condition is Hodgkin's disease, but one cannot tell positively. The papular eruption on the legs is like prurigo lymphaticus. A true leukemia infiltration of the skin has the leukemic histologic structure. A study of one of these nodules might be illuminating. The negative blood picture does not rule out leukemia. The glands should be examined histologically. It is true that the extreme enlargement seen in Hodgkin's disease is larger than that in leukemia, but in this instance, the extreme enlargement has been reached. I cannot conceive that the patient could have such an active glandular enlargement and have an

aleukemic blood picture. At present, I am inclined to favor a diagnosis of Hodgkin's disease.

DR. WISE: Would it be possible to get a section from the infiltrated lesion on the temple and report on it at the next meeting? The infiltrated lesion on the temple is more likely to show the true character of the disease on microscopic examination than would a section from the prurigo-like papules on the legs.

DR. CLARK: I agree with the probable diagnosis of Hodgkin's disease, in view of the blood picture. The lesions are the ones that occur in a frank case of Hodgkin's disease. I think the patient's condition can be much improved by large doses of arsenic.

DR. WILLIAMS: The two diseases mentioned are, of course, the first that suggest themselves, leukemia cutis and Hodgkin's disease, and of the two, I favor Hodgkin's disease. The blood picture and secondary anemia support this diagnosis. Of course, the possibility of aleukemic leukemia is recognized, but that diagnosis is improbable because two or three separate examinations have showed no leukemia. Most of the lesions on the legs may be only the result of scratching.

CASE FOR DIAGNOSIS (LYMPHANGITIS). Presented by DR. RULISON. (From the Cornell Clinic.)

Mrs. H. E., a widow, American born, aged 51, had had treatment for atrophic rhinitis in the fall of 1926. At that time she complained of crusts in her nose, foul breath, and difficulty at times in nasal breathing. At the same time she was found to have a slight catarrh of the eustachian tubes, a moderately enlarged heart, and a blood pressure of 200 systolic and 110 diastolic. Her urine had a specific gravity of 1.007, and a slight trace of albumin was present. She gave a history of scarlet fever in childhood and of an attack of facial erysipelas at the age of 25. When examined in the skin clinic at Cornell, she complained of redness of the nose of three years' duration and swelling of the same area which had persisted for one year. A diffuse erythema of the nose and adjacent skin was observed. This had no definite margin and was accompanied by a mild edema, most noticeable near the nasal orifices. The condition was said to be constant. The patient did not complain of sensory disturbances. There was no evident atrophy, scarring or marked scaling. Moderate telangiectasia and some enlargement of the sebaceous gland orifices were observed.

DISCUSSION

DR. FRASER: The condition is chronic cellulitis, with lymph stasis. I cannot say what the infecting organism is. The clinical picture is not that of erysipelas, and I do not believe the condition has any relation to Rosenbach's erysipeloid.

DR. ELLER: I would call the condition chronic lymphangitis.

DR. MALONEY: I agree with that diagnosis (chronic lymphangitis). I think it probably comes from the infection in the nose.

DR. HIGHMAN: I agree with the diagnosis of the previous speakers (cellulitis and lymphangitis).

DR. CLARK: I agree with the diagnosis of cellulitis and lymphangitis.

DR. WILLIAMS: I agree that the condition is chronic lymphangitis. The case will serve as a peg on which to hang a protest against calling such eruptions erysipeloid. Erysipeloid is a definite disease caused by a definite organism, and yet there is a tendency to call cases of lymphangitis by that name.

DR. CLARK: I suggest that the patient might be helped by two or three daily applications of stupes of hot boric acid over the whole area, with attention to the inside of the nose.

NEUROFIBROMA. Presented by DR. FRASER.

C. B., a woman, aged 33, American born, had a lesion situated over the upper border of the right scapula, which first appeared eleven years previously as a reddish blue spot, following a blow against a medicine cabinet. It gradually increased in size and at presentation it was 1 by 1½ inches (2.5 by 3.7 cm.). The clinical diagnosis was sarcoid, but histologically, the lesion was a neurofibroma.

DISCUSSION

DR. WISE: In an isolated lesion of this type, the diagnosis of neurofibroma is justified only if the microscopic examination shows that part of the lesion is made up of nerve sheath structures. I doubt that this lesion is analogous to those of Recklinghausen's disease.

DR. HIGHMAN: I think Dr. Wise's remarks are apropos. In neurofibroma it must be demonstrated that the tumor arises from the nerve sheath and is purely of nerve sheath origin. Ordinary fibroma will include some nerve elements in its own mass, but not any more than might be included in a scar. The word neurofibroma is used too casually in cases of this sort and in cases of Recklinghausen's disease. The condition is not invariably neurofibroma.

LUPUS ERYTHEMATOSUS. Presented by DR. WILLIAMS.

A. L., a man, aged 31, born in New York, presented an eruption which began three years previously on the scalp; it then appeared on the face, and later on the body. He had received no special treatment. At presentation, the scalp showed patches of atrophic baldness. The active lesions were near the ears, and extended down the middle of the back. They were of a brighter red than is usual in lupus erythematosus, covered with adherent, white scales, and many showed atrophic scarring in the center. The case was interesting because of the occurrence up and down the back of lesions of the type usually seen on the face.

DISCUSSION

DR. LANE: I agree with the diagnosis. The distribution of lesions is unusual.

DR. CLARK: I agree with the diagnosis. I understand that a Wassermann test has not been made. Before an absolute diagnosis is determined, I would like to see a report on the Wassermann reaction or antisyphilitic treatment. I have seen a similar case in which there were lesions on the trunk, face, arms and backs of hands that turned out to be syphilitic. I believe, however, that this condition is lupus erythematosus.

DR. WISE: I agree with the diagnosis of lupus erythematosus, and I think that it is a good case in which to try the effect of the gold solution. I have become more optimistic in regard to that treatment than I was before, with my augmented experience with the gold compounds in this disease.

DR. MALONEY: I understand that in some disseminate cases, the gold and sodium thiosulphate did not do so well, and that some cases have been reported in which the condition became worse with the use of gold and sodium thiosulphate.

DR. A. S. CLARK: The question of gold and sodium thiosulphate has been brought up, and since Dr. Wise has spoken about it, I would like to say that I have seen some fifteen cases in which lupus erythematosus was healed by treatment with the sodium thiosulphate. I have a patient who had an extensive disseminated type of discoid lupus over the chest, face, arms and legs—a much more marked condition than that in the case under discussion—that has responded equally well. There was a severe reaction in one case of lupus erythematosus after the

injection of the gold and sodium thiosulphate, but the patient had a serious focal sepis of the entire mouth; after the extraction of all the infected teeth and the clearing up of the foul sepsis, sodium thiosulphate was administered without any untoward results. After seeing several of these cases in which the focal sepsis reaction occurred, as a routine measure I began to send the patients to the dental and nose and throat departments to have any focal sepsis cleared up; and since then there have not been any reactions except those of the skin, which soon disappear. I should think that satisfactory results could be obtained in this patient, from what I have seen of other patients treated with the gold and sodium thiosulpate.

DR. WILLIAMS: The man has been put on treatment with gold and sodium thiosulphate, and I hope that he will improve.

PSEUDO-PELADE (BROCQ): Presented by DR. WISE.

J. C., an Italian, aged 47, had been troubled with the disease for three years. It began in the form of isolated denudations of the front part of the scalp, unaccompanied by signs of folliculitis or other evidences of inflammation. New spots soon appeared, consisting of roughly circular areas of alopecia, varying in size from that of a penny to that of a silver dollar, with rather well defined borders. The scalp presented a slightly depressed, waxy, ivory yellow appearance, only in the regions of alopecia. The sites of the hair follicles had completely vanished, leaving a smooth, moderately atrophic skin. There were no signs of peripheral folliculitis, as seen in folliculitis decalvans and alopecia cicatrisata. Favus was eliminated in the diagnosis.

DISCUSSION

DR. LANE: Dr. Wise noted that this case is the first to be presented in which there were not any inflammatory areas. Folliculitis decalvans, as Dr. Wise said, is similar in appearance, but the invaded zones show scattered lesions of inflammatory folliculitis.

DR. WILLIAMS: I recall two cases in sisters which closely resembled the one presented. In my cases, however, the alopecia was diffuse, covering a large part of the vertex, but not producing any distinct areas of absolute baldness. As in this case, there was distinct atrophy. There were not any pustules, and only occasionally a little erythema could be seen surrounding a hair follicle. I believe that all these cases belong in the same class as folliculitis decalvans, ulerytherma and similar conditions. The essential feature in each case is a destructive folliculitis. Usually the folliculitis produces a visible redness, but sometimes it does not.

DR. ELLER: There are two opinions regarding folliculitis decalvans: one, that this disease is identical with that of pseudo-pelade of Brocq, and the other that the two mentioned conditions are different disease entities. Sabouraud thought that they were identical; Ormsby thought that the term pseudo-pelade designated a definite clinical entity. Its lesions are round or oval, varying in number and size, and they usually present a white, slightly atrophic surface. At times they are pinkish, but they never present a definite folliculitis or an inflammatory areola such as is found in folliculitis decalvans in the early stages. My opinion is in accordance with that of Ormsby.

DR. WISE: I agree with Dr. Williams about the futility of differentiating these diseases. My object in presenting this case is that it is the first one of a few I have seen in which there were no signs of inflammatory reaction preceding or accompanying the disease. Folliculitis decalvans always suggests lupoid sycosis.

a folliculitis with peripheral extension of the eruption. With regard to this case, it is remarkable that patches of hair should fall out without any preexisting inflammatory signs.

ICHTHYOSIS. Presented by DR. RULISON. (From the Cornell Clinic.)

Mrs. M. L., an Austrian Jewess, aged 48, had had a skin condition for eight years, consisting of a generalized, dry, scaling, without sensory disturbance. She said she had had a rather dry skin since girlhood, and that the present condition had developed slowly.

On the lower extremities the appearance was that of a moderately severe ichthyosis. On the upper portion of the body, in addition to the dryness and scaliness, areas of erythema and some telangiectasia were observed. The face, hands and feet were free from abnormality. Dr. Rulison had considered the possibility of parapsoriasis.

DISCUSSION

DR. WISE: I agree with the diagnosis of ichthyosis vulgaris.

DR. CLARK: The amount of erythema is unusual in a woman with ichthyosis. I should say the diagnosis was ichthyosis.

DR. WILLIAMS: The condition certainly is ichthyosis. The history may be accounted for by the fact that she did not notice it until it became marked. It may be simply a dermatitis on top of an ichthyosis, which is common. Some of the lesions, however, are fixed, scaly patches resembling parapsoriasis, and ichthyosis plus parapsoriasis would account for the condition.

DR. FRASER: The patient is probably mistaken in her belief that the disease began only eight years before. The condition was probably present in a mild form since childhood. I agree with the diagnosis of ichthyosis. Regarding Dr. Williams' reference to an inflammatory process, there is not any evidence of a cellular exudate in the corium. The red appearance of the lesions on the trunk is probably due to vascular dilatation. This fact, and the absence of parakeratosis, would tend to exclude the diagnosis of parapsoriasis. Clinically and histologically the case is ichthyosis.

DR. LANE: No doubt the diagnosis of ichthyosis is correct. I think two conditions are present: one is keratosis pilaris of the red variety, which is a common accompaniment of ichthyosis. The diffuse erythema is probably due to rubbing. As the warm weather comes on, a good deal of the generalized erythema will probably disappear, and the redness of the keratosis pilaris will lessen.

DR. WHITEHOUSE: I agree with the diagnosis of ichthyosis and with the remarks of Dr. Lane. The woman said that the lesions were not red except in the winter, and that would agree with what Dr. Fraser said—that the redness was due to a dilatation of the vessels and not to inflammation.

RADIODERMATITIS. Presented by DR. WILLIAMS.

Mrs. D. L., aged 36, born in England, presented an eruption of three years' duration on the upper lip and chin, which was rather sudden in onset. She said that she had not had any marks or blemishes on the skin and had never received any electrical treatment on the face. She had had a badly abscessed tooth about three years before, at which time numerous (two or three) roentgenograms were made. The eruption had appeared since that time. The case was interesting, as the condition looked exactly like that in cases of roentgen-ray dermatitis, resulting from the attempt to remove superfluous hair by some form of radiation.

DISCUSSION

DR. CLARK: I should think from the location of the lesions on the upper lip, and the typical roentgen-ray lesions on the side of the face, that the woman is intentionally misleading us; that she has had hypertrichosis and has tried to have it removed by roentgen rays.

DR. WISE, DR. MALONEY, DR. RULISON, DR. LANE and others: We agree with the diagnosis of roentgen-ray dermatitis.

MYCOSIS FUNGOIDES. Presented by DR. WILLIAMS.

J. A., aged 47, a laborer, born in Cincinnati, had had syphilis thirteen years prior to presentation, for which he received two doses of arsphenamine. He had not had any other illnesses. Seven weeks before presentation, a red spot appeared on the left temple which gradually increased in size to about 1½ inches (3.77 cm.) in diameter. The spot was a rounded, dull red, elevated, nonulcerated plaque. Other lesions gradually appeared on other parts of the body, with general erythema. One mass on the front of the neck and another on each leg had ulcerated. The lesion on the neck was healing under roentgen-ray treatment. The patient presented a general adenopathy.

DISCUSSION

DR. CLARK: I agree with the diagnosis. It is an exceedingly rapid case. The lesions look something like fibrosarcomas; they are all infiltrated, and that would be in accord with the probable diagnosis. The only disagreement might be the question of lack of severe itching.

DR. WISE: I think the diagnosis will probably prove to be mycosis fungoides, and I await the results of the biopsy examination and blood examination with interest.

DR. HIGHMAN: To me, the eruption suggests leukemia. The color of the skin in general, and of the forehead and cheeks in particular, the infiltrations at these sites, the character of the two tumors on the chest, the general erythroderma and the beginning glandular enlargement, all favor a diagnosis of leukemia rather than mycosis, though it is obvious that the condition may be mycosis. As to the itching, there is no doubt that the man is scratched all over. He has a generalized erythroderma, which is more in favor of leukemia than of mycosis; his general color is not so much that of mycosis as that of leukemia. I should say that after all the suggestions, the one thing that need not be done is the Wassermann test, for even though positive it would be irrelevant.

DR. LANE: My impression of the case is exactly opposite that of Dr. Highman. The tumors appear to me to be almost typical of mycosis fungoides. The few tumors of such size that I have seen in cases of leukemia have had a darker, somewhat bluish tinge in contrast to the bright red of the tumors in this case.

DR. FRASER: The universal enlargement of the lymph nodes speaks against the diagnosis of mycosis fungoides. The mycosis fungoides of Alibert was not accompanied by enlarged nodes. The diagnosis may be leukemia.

DR. WILLIAMS: I agree with Dr. Lane, probably because I have not seen many cases of leukemia cutis, and because the case does look like mycosis. The man has the thick red skin of the early stages of mycosis. I shall make all the studies I can and report on the case later.

A Case for Diagnosis (Nevus). Presented by Dr. Fraser for Dr. Schwartz.

C. V., a young man, was previously presented at the February meeting of the society.

DISCUSSION

Dr. Lane: I still think that the diagnosis of nevus is probable.

Dr. Clark: This is a peculiar case, and the nearest diagnosis I can make is a nevus.

Dr. Wise: I believe that a succession of histologic examinations, taken from different types of lesions, would eventually reveal the true condition.

Dr. Eller: I have the same impression now that Dr. Clark has, i. e., that this is a nevoid condition. The fact that these lesions appeared but recently does not militate against this diagnosis, as a nevus might appear late in life.

Dr. Highman: I have never seen anything like it. I do not know what it is.

Dr. Whitehouse: I think Dr. Eller's remarks come close to the diagnosis—that it is a nevus—and that Dr. Wise's suggestion of several biopsies would probably lead to a correct diagnosis.

Pityriasis Rubra Pilaris (Devergie) (?) Presented by Dr. Whitehouse.

G. B., a girl, aged 15, presented an eruption on the back of the neck, arms, legs and upper torso, which had been present for ten years. There were only moderate subjective symptoms, and not any thickening of the palms or keratotic follicular lesions on the dorsum of the phalanges. Itching was present at times. The flexor surfaces of the elbows and knees were diffusely involved. The eruption had never disappeared nor changed much, in either winter or summer, for ten years. It would become slightly worse, however, in September and December. The eruption was characterized by lichenoid papules, many being flat and shiny; but numerous accuminate follicular plugged papules were likewise present. Some were scattered, as on the legs and arms, but for the most part they fused over large areas, especially on the back and sides of the neck and over the shoulders. The involvement of the flexures and the absence of lesions on the palms, soles and phalanges, seemed to distinguish the eruption from pityriasis rubra pilaris.

DISCUSSION

Dr. Lane: I think that the lesion on the nucha is the papular form of neurodermatitis, and I am inclined to think that all of the lesions are those of nuerodermatitis.

Dr. Williams: The conception of neurodermatitis needs revision. While many cases conform to Brocq's conception of an eruption which is a reaction to mechanical irritation, in others the itching is slight or absent, there are no scratches, and the patient (apparently honest) denies applying friction. In these cases the first lesion seems to be a slight thickening or lichenification of the skin of the extensor surface, just below elbows or knees, and itching may be absent altogether. I am inclined to believe that this particular type is to be considered a personal peculiarity or anomaly, rather than a disease.

Dr. Highman: I agree with Dr. Lane entirely.

Dr. Eller: I agree with the diagnosis of neurodermatitis.

Dr. Wise: I believe that the diagnosis is pruritus with lichenification.

Dr. Whitehouse: I must apologize for bringing the patient with a tentative diagnosis of pityriasis rubra pilaris, but she said that she had been seen by many

physicians, and that this was the first time any name had been applied to the condition. As I had only a few moments to examine the patient, I thought this would be a good opportunity to endeavor to establish a diagnosis. The case does not look hopeful from a thereapeutic standpoint.

JOHN E. LANE, M.D., *Secretary.*

PITTSBURGH DERMATOLOGICAL SOCIETY

Monthly Meeting, March 24, 1927

FRED M. JACOB, M.D., *Presiding*

DERMATITIS VENENATA (INECTO). Presented by DR. G. J. BUSMAN.

M. G., a woman, single, presented a diffuse erythema with oozing of the entire scalp, ears, forehead, neck and face. Two weeks prior to presentation the patient had hair dye (Inecto) applied to the scalp, following which the present severe reaction developed.

DISCUSSION

DR. CRAWFORD: The diagnosis of dermatitis venenata should be qualified by the irritant whenever possible.

DR. BEINHAUER: I saw the patient three days ago, and at that time she admitted that a similar attack resulted from hair dye applied six years before.

MORPHEA. Presented by DR. H. G. WERTHEIMER.

C. C., a woman, aged 21, entered the clinic on June 8, 1926. Three months previously she had noticed a shiny area of the skin involving the neck above the suprasternal notch. Later she noticed similar lesions on the right arm and right side of the neck. When first observed the lesions were well defined, soft, smooth, shiny and wrinkled, varying in size from that of a five cent piece to 2 inches (5 cm.) in diameter. The lesions slowly increased in size, and several new patches had developed within the past six months. The patient was seen one week before presentation, and the patches appeared atrophic, larger and depressed, and were surrounded by a definite violaceous halo. At no time were any subjective symptoms present, and improvement was not noticed after thyroid medication.

DISCUSSION

DR. HOLLANDER: I disagree with the diagnosis presented and offer the diagnosis of lichen planus atrophicus because of the fine shiny papules, depigmentation and composition of the papules present.

DR. GUY: I favor the diagnosis of lichen planus atrophicus. The lesions began as small white papules which spread peripherally and showed fine, whitish, atrophic centers. Further, the satellite discrete lesions were white infiltrated papules.

DR. WERTHEIMER: I will consider the diagnosis of lichen planus atrophicus and will make a biopsy to settle the dispute and report at a later meeting.

A CASE FOR DIAGNOSIS. Presented by DR. L. G. BEINHAUER.

J. S., a man, aged 31, married, presented a fixed eruption involving the forehead and regions of the upper part of the cheek. The eruption appeared eight months before presentation as large, rose-red, pruritic papules which cleared spontaneously

within three months. About two months ago the lesions reappeared on the forehead and then over the infra-orbital regions as papulocircinate lesions which have persisted without change to date. The newest lesions were definite papules which later coalesced, forming iris-like lesions with a definite rose-red, slightly elevated border and a fawn colored slightly keratotic center. All lesions blanched on pressure and caused no subjective symptoms. No history of ingestion of drugs was elicited. The patient said that he had not had venereal disease. The blood Wassermann test, urine and blood analyses were negative.

DISCUSSION

DR. CRAWFORD: I offer the diagnosis of the erythematosus type of lupus erythematosus because of the superficial character, sharply defined border and keratotic center with patent follicular openings.

DR. BEINHAUER: I presented the patient because the question of diagnosis was not clear. The lesions were improving under treatment with potassium iodide in spite of the negative history and serologic observations. Biopsy will be attempted and a report made at a later meeting.

PSORIASIS—ACTINODERMATITIS (RADIUM). Presented by DR. G. J. BUSMAN.

F. E. H., a housewife, aged 59, presented a confluent erythema with much infiltration of the palmar surface of the left hand and wrist. A similar condition with normal skin interspersed was present on the dorsum of the left hand. The fingers were flexed, due to the intense edema and inflammatory reaction. There was no ulceration and no definite tendency to superficial capillary dilatation as noted in a late actinodermatitis. There was a small, scaly, slightly inflammatory lesion on the ring finger of the right hand. A small plaque about 1 inch (2.5 cm.) in diameter was present on the right forearm and a similar lesion beneath each breast, while larger confluent lesions which resembled the lesions on the left hand, were present over the buttocks. A few scattered scaly lesions were present on the scalp. The condition developed five years before presentation, and the patient was treated for it by eminent dermatologists in Chicago and Philadelphia. Former treatments consisted of roentgen-ray exposures, and within the past three months eight radium applications were applied in Chicago with resulting severe reaction of the left hand. The diagnosis previous to the radium treatment was lupus erythematosus.

DISCUSSION

DR. GUY: I think that this is an example of a lupus pernio in a psoriatic patient. I cannot believe that the eruption is related to radium application. The lesion on the right elbow is typical of psoriasis. The patient was presented previously by Dr. Crawford, with a sharp marginated, scaly eruption which was perianal in location; the patient had blamed the condition on roentgen-ray treatment. The question of the possibility of a hysterical factor in mechanical and chemical applications should be considered.

DR. HOLLANDER: I favor the diagnosis of lupus erythematosus because of the scaling, atrophy and doubtful telangiectasia present.

DR. CRAWFORD: The sharp demarcation of the lesion suggests the possibility of dermatitis artefacta superimposed on a radium dermatitis.

LUPUS ERYTHEMATOSUS. Presented by DR. GUY and DR. JACOB.

Mr. R., aged 43, married, presented only smooth, noninflammatory scars marking the sites of preexisting lesions of lupus erythematosus. Various local remedies had

been administered without effect. Injections of Dr. Schamberg's gold sodium thiosulphate led to complete disappearance of activity after nine weekly injections. The last injection was given three months prior to presentation.

SYPHILIS—CORYMBOSE TYPE. Presented by DR. HOLLANDER and DR. BAER.

Mrs. W. C., aged 36, divorced, presented a disseminated eruption affecting the arms, shoulders, back, face, neck, legs and scalp. The individual lesions were pinpoint papules covered by a slight scale which was brownish in appearance. The lesions were confluent, making circinate configurations, and when the scales were removed, the lesions had a bright red hue. The palmar lesions were flat squamous papules. The patient had been suffering from a sore throat for the last three months, and an associated cervical adenopathy was present. The Wassermann and Kahn reactions were heavily positive.

DISCUSSION

DR. HOLLANDER: Dr. Baer and I presented the patient because of the unusual type of lesions and the scarcity of this type of syphilis.

LUPUS ERYTHEMATOSUS. Presented by DRS. GUY and JACOB.

SOLITARY GUMMA. Presented by DR. BUSMAN.

ALOEPECIA AREATA AND LEUCODERMA. Presented by DR. CRAWFORD.

BASAL CELL EPITHELIOMA (?) Presented by DR. CRAWFORD.

HERPES FACIALIS RECURRENS. Presented by DR. CRAWFORD.

L. G. BEINHAUER, M.D., Secretary.

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